

# SD Times

SOFTWARE DEVELOPMENT

The Industry Newspaper for Software Development Managers

MARCH 15, 2000

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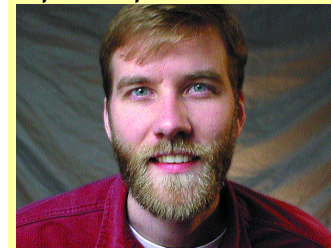
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## FLASHLINE TASTE-TESTS JAVA AND EJB

BY REBECCA ROHAN

Is the development community ready to move from incremental compilation to incremental testing?

Flashline.com Inc.'s Quality Assurance Lab, a testing outsource service for Java code, JavaBean components and Enterprise JavaBeans (EJB), is up and running with the idea that developers and IT managers can submit code for testing throughout the development cycle—allowing them to identify and correct problems before they become costly.

"We have expertise you won't see in-house," said Charles Stack, Flashline's president and CEO ([www.flashline.com](http://www.flashline.com)). "You send us your code, we analyze it, and it comes back with recommendations." Both subscription and piecemeal pricing are avail-

able. Piecemeal prices will be as low as \$50 per test and may run up to \$2,500. Flashline will negotiate subscription prices on an individual basis.

The move to testing broadens Flashline's menu of mostly Java services, which includes a component marketplace that brings together buyers and sellers for online purchase of pre-developed software, a place for developers to advertise their services, and a venue for buyers to post requests for bids ("Components by Design"—formerly "Beans by Design"). Developers bid, buyers chat, and Flashline takes care of the advertising and online transactions while counting a few beans into its own jar.

The new Quality Assurance Lab supports Flashline's buy-

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## Microsoft to Developers: 'You Are Indispensable to Programmable Web'

OUTLINES PLANS FOR OVERHAUL OF VISUAL BASIC, VISUAL STUDIO

BY EDWARD J. CORREIA

In his first major announcement since taking the helm of Microsoft Corp., CEO Steve Ballmer told of plans to revamp its flagship development tool, Visual Basic and the broader suite, Visual Studio, to make the tools more Web savvy.

By enhancing existing products with Web capabilities, Ballmer said, developers will be able to use their existing knowledge and skills to build the next generation of Web applications.

In explaining Microsoft's vision of the future in a speech delivered to more than 2,000 developers at the Visual Basic Insiders Technical Summit (VBITS) last month, Ballmer outlined a list of capabilities centered around Visual Basic.

The new features will permit companies "to access services exposed by other businesses, enabling several companies to work together to support a common customer," he said, referring to an example involving a retailer, a credit-

card company and a parcel service.

### NEW WEB SERVICES

Making this possible will be Web Services. Analogous to the Windows services that VB developers are accustomed to using, Web Services will make standard Web protocols like HTTP and XML directly available to Visual Basic, eliminating the need to write code for these capabilities from scratch or import them from Visual C++, according to the company.

Microsoft will further enhance its veteran development tool with ASP+ Web Forms, a drag-and-drop variant of the



Steve Ballmer promised Web-centric updates to Microsoft's Visual Studio.

Rapid Application Development (RAD) model, which will be based on XML and Microsoft's COM+ component object model. ASP+ will work with any Visual Studio language such as Visual Basic, Visual C++ or Visual J++, the company said. Web Forms will permit develop-

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## IBM OFFERS NEW PORTING TOOLS FOR AS/400

Big Blue also lines up new ASPs for its midrange platform

BY ALAN ZEICHICK

Call it the Rodney Dangerfield of enterprise platforms. While it's not quite fair to say that the AS/400 gets no respect, IBM Corp.'s midrange platform is often overlooked, as analysts, journalists and Internet startups focus on the three-way battle among Unix, Windows and Linux.

That doesn't mean that the AS/400 platform is standing still—and it's not, thanks to a new environment that allows a subset of AIX applications to run under OS/400, the AS/400's operating system.

According to IBM, this new capability, called AS/400 Portable Application Solutions Environment (AS/400 PASE), is primarily designed to allow the integration of packaged application suites, such as enterprise resource planning, e-commerce, business intelligence, supply chain and customer relationship management applications onto the AS/400.

Technical documentation released about AS/400 PASE, which is included with OS/400 version 4 release 4, explains that it's a modular component of OS/400 that provides a subset of AIX run-time functionality, by using the AS/400's PowerPC processor's ability to switch between AS/400's native run-time and AIX run-time modes.

Applications deployed using AS/400 PASE can access its file systems, security and DB2 databases on the AS/400.

### IT'S SO SLIC

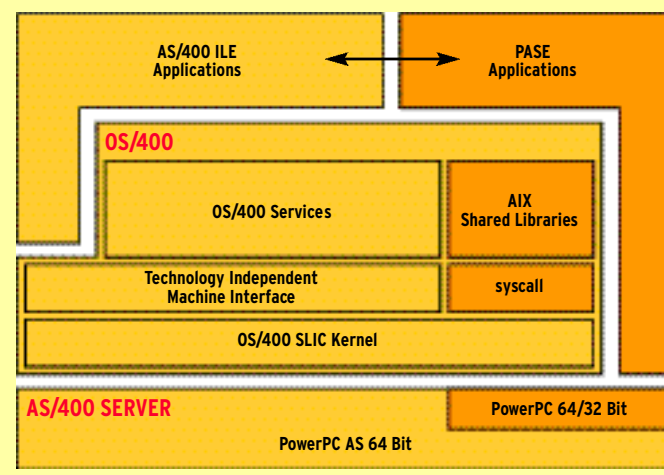
Architecturally, the introduction of PASE leverages the AS/400's modular kernel design and exploits the PowerPC processor's ability to execute both the AS/400's native 64-bit CISC instruction set and the 32-bit RISC instruction set re-

quired by AIX, IBM's version of Unix. Previously, OS/400 itself included a small kernel, SLIC (System Licensed Internal Code), which managed the hardware and memory address space.

Above SLIC sits a hardware adaptation layer, which IBM calls the Technology Independent Machine Interface, or TIMI. Above TIMI live

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### AS/400'S PASE ADDS AIX CODE LAYER



**“So the challenge here was knowing the speed of how quickly we had to bring shoe vendors online.”**

**“We went from 6 to 10 to 20 vendors and we’re continuing down that road.”**

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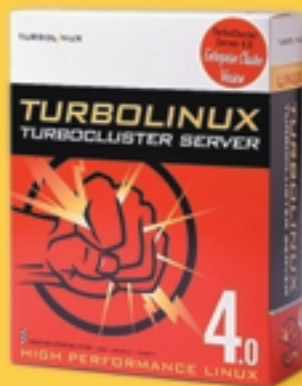
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# Metacode Components Improve Web Searches

Claims COM objects provide 70% search success rate

BY DAVID RUBINSTEIN

*Sshhhhhhh!* That's the sound of library science colliding head-on with the world of high technology.

Metacode Technologies Inc., a San Francisco start-up roughly 14 months old, is applying old information-science techniques to new technology with two new products—Metafind and Metatagger—that they claim will help organize information in a database or catalog to improve the success rate of searches for that information.

"[Librarians] have a lot of expertise in the area of delivering information," said Paul O'Leary, senior information scientist at Metacode. "We're bringing that expertise and experience in a useful way to get information."

Based on in-house testing, Metacode claims only 20 percent of end users searching for a product or information on a Web site or in a database find exactly what they're looking for. With its new system of tagging and searching, Metacode believes it can increase that number to a 70 percent success rate.

Metafind and Metatagger are COM objects customized to work in conjunction with existing applications. Metafind allows database operators or Web site visitors to quickly find what they want, even if they don't know how to ask for it, by accommodating variations in terminology and the wide range of errors users make when entering queries for a product or content.

The COM object has both Java and Visual Basic APIs, making it "flexible in terms of what you can hook it into," said Roger Avedon, director of development. The initial release of Metafind supports Solaris and Windows NT. Metacode is considering a Linux release.

Metatagger allows content originators, publishers and distributors to automate the process of categorizing and labeling text content while lowering the cost of editing and indexing. "We're moving toward a thin-client implementation, which would increase portability," Avedon said. The Metatagger client application currently runs on Windows NT.

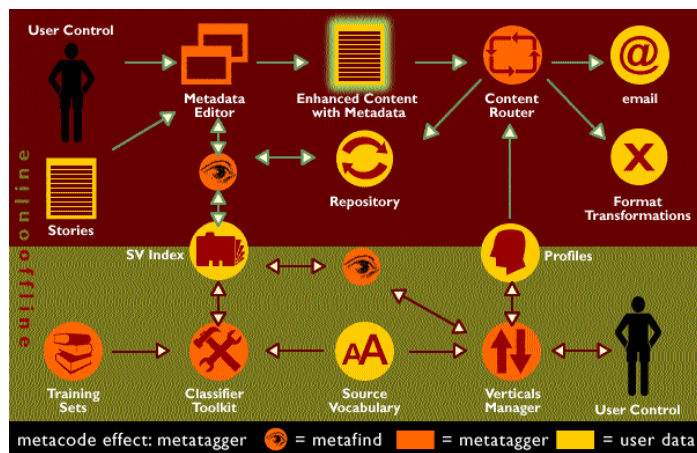
The products can be used independently or in concert with each other. Metafind has just been released, and Metatagger is expected to be available by mid-March.

"Some software vendors include a small amount of this

functionality," said John Hellwig, CEO of Metacode (www.metacode.com). "We can do much better than any out-of-the-box solutions."

Metacode is moving into vertical domains that have specialized vocabularies, such as pharmaceuticals, health care chemicals, business and finance, publishing and home improvement—"anything where you have to query against a set of terms," said Dan Ortega, marketing director.

"Say someone is diagnosed with Lou Gehrig's disease," O'Leary explained. "Amyotrophic lateral sclerosis [the medical name for the disease] is hard to remember and hard to spell. We bring in vocabularies that identify other names and add algorithmic approaches for matching," so that even if the words are misspelled, or placed in the wrong sequence, the software still will be able to locate the information. ■



Metacode's Metatagger, Metafind automate and improve Web searches.

## Compuware Updates DevPartner, DriverStudio

Compuware Corp. has upgraded two products in its NuMega product line to improve their support for Windows 2000.

The first, NuMega DevPartner Studio 6.5, broadens its core support for Visual C++, Visual Basic and Java by adding new support for Windows DNA 2000 and Web technologies.

According to Compuware (www.compuware.com), DevPartner Studio 6.5 introduces the first distributed profiling and coverage tools with multi-language, multitier support. By automatically finding software errors, performance bottlenecks and untested code, DevPartner Studio 6.5 is claimed to accelerate software develop-

ment and improve application performance and reliability.

DevPartner Studio 6.5, expected to be available in April, includes developer productivity tools for source code analysis, run-time error detection, performance profiling, memory profiling and code coverage analysis.

According to the company, these tools have been enhanced to support Microsoft Windows DNA 2000 products and technologies including Visual Studio, COM+, Microsoft Transaction Server, Microsoft Message Queue, Internet Information Services, Visual Basic WebClasses, Active Server Pages and ActiveX Data Objects.

The second update, Driver-

Studio 1.5, is designed to accelerate the development of device drivers for Windows platforms, including Windows 2000, with enhanced debugging and testing capabilities.

One of the new features in 1.5 is code coverage analysis for kernel mode drivers. The NuMega TrueCoverage Driver Edition is said to improve the testing process by providing a visual display of code coverage information that enables a developer to precisely determine how thoroughly a driver has been tested. As a result, developers could deliver more reliable device driver software.

DriverStudio 1.5 is available now; its list price is \$2,499. ■

## News Briefs

### COMPANIES

**SalesLogix Corp.** and **Macola Inc.** have signed an OEM agreement under which the companies will collaborate on linking their respective technologies . . . **Red Hat Inc.** has expanded its kernel development group. The work done by the Red Hat kernel development group, as with all organizations working on the Linux kernel, is submitted to Linus Torvalds for approval before being incorporated into an official Linux update . . . **Alpha Processor Inc.** has introduced its Linux Developer's Program, offering developers an opportunity to purchase discounted UP1000 Alpha-based development workstations . . . **M&A West Inc.** launched its Linux portal site, www.links2linux.com, intended to be a clearinghouse for Linux developers, investors and end users . . . **Cisco Systems Inc.** is now among the most admired companies in America, according to *Fortune Magazine's* annual survey of the country's leading business men and women. **General Electric Co.** again was named the most admired company, while Cisco ranked fourth. Other technology companies in the top 10 include **Microsoft Corp.** (2), **Dell Computer Corp.** (3) and **Intel Corp.** (8) . . . This month, **Salon.com** is expected to launch a Web site dedicated to the open-source movement. The new destination will serve as an informational and reference resource on the open-source phenomenon that will draw largely on the reporting and commentary of Andrew Leonard, senior technology writer for the Salon Technology site . . . **EarthWeb Inc.**'s dice.com, a nationwide job site for IT professionals, has completed exclusive agreements with 32BitsOnline and PenguinApps to provide dice.com's job listings on those sites . . . **IBM Corp.** will offer development software and technical support at no charge to business partners that are building Windows 2000 applications for connected enterprises. The offering of software and support is designed to ease Windows 2000 integration with other critical business systems inside an enterprise or supply chain. The software is from IBM's PartnerWorld for Developers Web site, www.developer.ibm.com, beginning March 31. A version of WebSphere with Windows 2000 support will be available for download in April.

### PRODUCTS

**Open Cascade**, a set of C++-based CAD/CAM/CAE modeling components from Matra Datavision, is now available for Windows NT, Solaris and Linux. New to Open Cascade is a rapid development environment for graphics applications. Download source code and binaries from www.opencascade.org . . . **Advanced Software Technologies Inc.** has released **GDPro 4.0**, a UML tool kit for Java and C++ developers using CORBA. New features include a system hierarchy window for "drag and drop" capability, and sequence diagrams that include "cars" and "spreaders" for easier diagram construction. GDPro 4.0 supports Windows 9x/NT and Solaris. Pricing begins at \$2,495 for Windows and \$3,995 for Solaris . . . **InstallShield Software Corp.** has announced the availability of **InstallShield Professional 2000 Second Edition**, with expanded features that include an object development kit (ODK). The company also released an update to its Web-based installer, **InstallFromTheWeb 3.1** . . . **Vitrix Inc.** has released an SDK for its **HourTrack 2000 Workforce Management Suite** of labor management solutions. HourTrack 2000 identifies employee-related time expenses, minimizes unnecessary payroll losses and improves planning for budgets, schedules and workday deployment . . . **Informix Corp.** has released **Foundation.2000** and **Cloudscape 3.0** on Linux. Informix is also announcing special price promotions for Foundation.2000 for its Intel-based Linux software. The promotion is to run through Oct. 10 . . . **Persistence Software Inc.** is porting **PowerTier for Enterprise JavaBeans (EJB)** to Linux. PowerTier for EJB provides stateful fail-over, partitioning and workload balancing through PowerTier's ability to synchronize multiple object caches distributed across multiple servers. PowerTier for Linux is expected to be available

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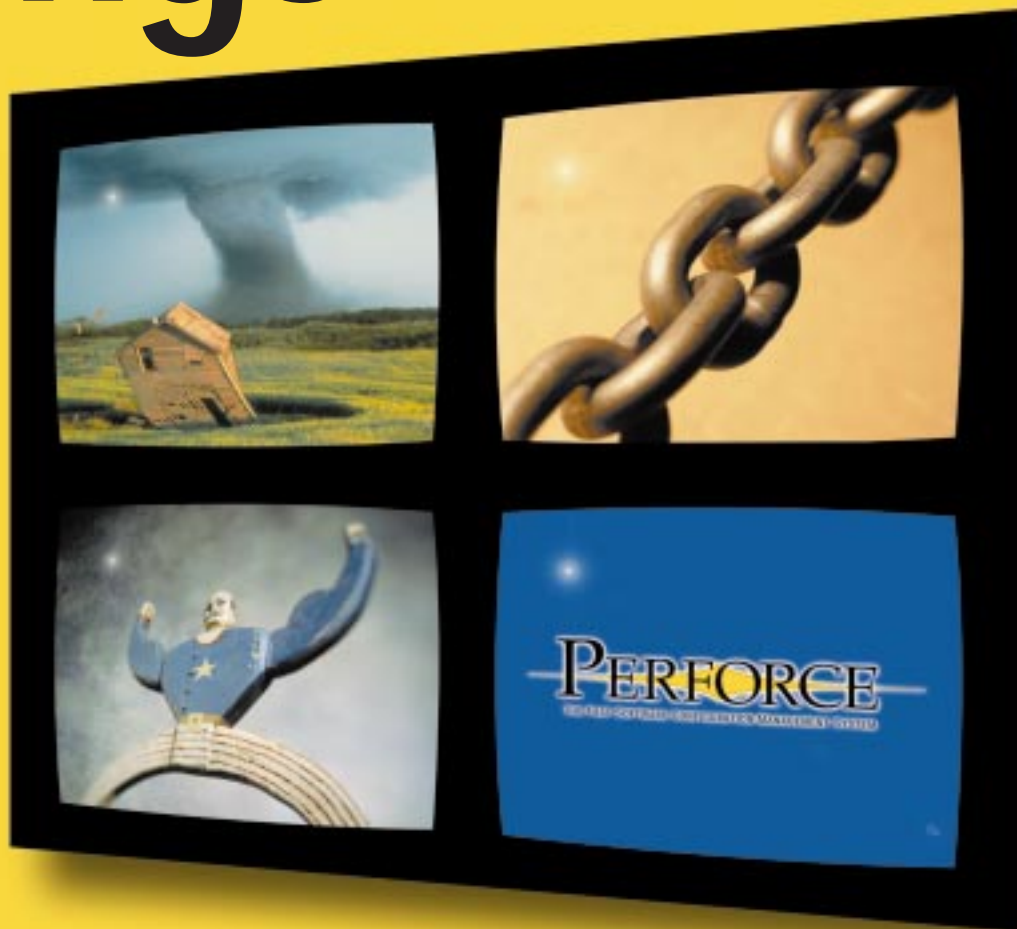
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# WaSP Puts Good Buzz on XHTML 1.0 Standard

But keeps pressure on browser vendors to implement earlier standards

BY REBECCA ROHAN

Earlier this year, the World Wide Web Consortium put its official "Recommendation" stamp on XHTML 1.0, and the nonprofit Web Standards Project (WaSP) made a beeline to the applause machine to proclaim its support for the W3C's move. It since has buzzed around browser makers' bonnets in a continued campaign for supporting existing standards such as XML, CSS, DOM and HTML.

XHTML 1.0 is the link between the old and new ways of evolving Web capabilities. With the old way—HTML—the W3C created new generations of specific tags to do specific tasks with each new HTML version. With the new way—XML—individual Web authors can create tags to do anything they please on demand, because XML isn't a new set of tags—it's a uniform way for people to create their own. It's the difference between a written language based on symbols that depict specific words such as "dog" or "man," and language based on an alphabet. Twenty-six characters in the word-symbol language convey 26 objects or concepts. Twenty-six characters in the alphabet convey whatever you want to say.

To bridge the gap between the Hypertext Markup Language (HTML), which was relatively simple to learn and create, and the more rigorous, though not entirely different Extensible Markup Language (XML), the W3C basically shaped HTML 4 into an XML 1.0 application that remains compatible with existing browsers as long as authors adhere to a small set of guidelines, and called it XHTML.

XHTML is no less a step to standardization and its benefits than convertible currency, touch-tone phones, Arabic numerals and English. And that's wind beneath the wings of WaSP ([www.webstandards.org](http://www.webstandards.org)), a large body headed by a small but high-powered steering committee seeking commitment to standards from not only the W3C, but from developers and browser makers.

"Some of the members of the steering committee are 'invited experts' to the W3C," said Jeffrey Zeldman, group leader of WaSP.

"An invited expert is someone who is not necessarily a dues-paying member of the W3C, but who is so totally knowledgeable in some area that they can help with that area of the standards."

WaSP member Tim Bray



**Browser makers should compete on user interface features, not on variance from standards, said Jeffrey Zeldman.**

functions in that capacity for XML, and Todd Fahrner for Style Sheets. WaSP collected Bray and Fahrner after they already held their positions as invited experts in W3C. "Standards can't come from Netscape; they can't come from Microsoft; they can't come from Opera," Zeldman said. "They have to come from an impartial, noncommercial third party in which all the browser makers participate."

## THE BIRTH OF WASP

WaSP began in 1998 when Glenn Davis, co-founder of Project Cool Inc., and George Olsen of How2HQ.com spoke via list-serve about hours wasted debugging. "The reason I got involved," said Zeldman, "was that I spent most of 1997 figuring out why things I was doing weren't working. In 1996 the Style Sheets Recommendation came out, and in 1997 Internet Explorer 3 began to support it; but when I tried it, it wasn't working. I was frustrated and a lot of people were frustrated, and just felt like, 'Well, this is the way it is.' Then Glenn Davis and George Olsen said, 'Let's do something about it.'"

The group quickly grew to thousands of members, with a steering committee of roughly a dozen. Anyone can join the group by signing on at the Web site ([www.webstandards.org](http://www.webstandards.org)). "The membership is a way of saying to Microsoft or Netscape, 'Look at these people—10,000 of your customers aren't happy,'" Zeldman said.

"Two years ago I wrote to many of these companies, and that mail went into a vacuum," recalled Zeldman. "They were getting tons of mail." Now various members of the group help companies with their betas.

"We work with browser makers as they're developing their products—when asked—to help them implement the standards in a way that makes sense for people who use the Web, because this is not an abstract, academic exercise. We're doing this so the Web will work for people." Developers have informally told Zeldman they waste 25 percent of their time with problems caused by non-standards-compliance in browsers.

"Opera has always been about standards," Zeldman said, adding that Microsoft Corp. and Netscape Communications Corp. are headed toward 100 percent compliance in coming releases. Zeldman said it's important to convince browser makers to compete on user interface features and not on variance from standards. "Both Microsoft and Netscape

have claimed the Web Standards Project as an ally," said Zeldman. While the WaSP says "well done" to the people who created XML, it wants to remind everyone that "XHTML won't be able to do its job if the [standards that constitute it] aren't fully supported."

Invited XML expert and WaSP steering committee member Bray is one of the people who wrote the XML specification. "I think what the WaSP is saying is that XHTML is a good idea, but it's not going to really help people until the browser vendors finish up the implementation of some of the earlier standards that we've been bugging them about for the last couple of years," he said. "The crucial things we think they haven't finished are XML, CSS [Cascading Style Sheets] and the Document Objects Model." CSS and the DOM play a large part in XHTML.

"The Netscape people claim 5.0 is going to follow the rules

100 percent," said Bray. "It's not a shipping product yet. Microsoft is being relatively quiet in terms of saying what they will and won't support, so we'll just have to see what they do."

Zeldman wants to catch the browser makers with honey, but Bray said, "The real call to action is to browbeat the browser vendors to build in the missing pieces so we can start doing this stuff. Most IT managers get regular visits from their Microsoft evangelist. They should say, 'Damn the new features—take the existing features and make it follow the rules.' They should say that the most important thing that Microsoft and Netscape can do is to build in support for the missing features."

"Standards are pro-user," said Bray. "They make users' lives better and level the playing field, so that means vendors aren't going to support the standards properly unless their customers demand it." ■

## WRQ Updates Reflection Suite

Targets developers with host-to-Web emulation APIs, VBA support

BY ALAN ZEICHICK

Once strictly the province of network administrators, host-connectivity suites—despite their being labeled with the less-than-cutting-edge phrase "terminal emulation"—are increasingly of interest to enterprise applications. At least, that's the line taken by WRQ Inc., as it updates its Reflection host-to-LAN and host-to-Web emulation suites.

WRQ's flagship host-to-LAN terminal emulation server, Reflection version 8, now integrates Microsoft Corp.'s Visual Basic for Applications version 6. It has also passed Microsoft's Windows 2000 interoperability suite, and includes direct support for Windows 2000's Active Directory features.

Visual Basic for Application (VBA) support isn't completely new to Reflection 8. "The first version which had VBA support was Reflection 7," said Sue Lindsey, product manager for WRQ's Reflection product suite. "With Reflection 8, we went from VBA 5 to VBA 6, which is important to work seamlessly with [Microsoft's] Visual Studio 6."

"We've added the VBA; we've added event schedules. It's all about helping developers take information off the host and bring it into a Windows application," Lindsey said. VBA is

such a key part of the product, she added, "because VBA is an environment that's in [Microsoft's] Excel and Word and Access. It's very easy for those applications and Reflection to talk to each other. We can pass data automatically between the host and the applications."

What about non-VBA connectivity? "The APIs in Reflection are very well documented," said Lindsey. "It's open to any language developers want to use. But VBA is something that differentiates us, and that's the tool we provide. Most of our competitors have proprietary scripting languages, and they call them 'Visual Basic-like languages.' They're not actually OEMing Visual Basic from Microsoft, which is what we're doing."

Versions of Reflection 8 are available to connect with IBM's S/390 mainframes, AS/400 midrange systems, HP e3000 midrange systems, X Windows and OpenVMS systems; Reflection 8 itself runs on Windows NT/2000 Server.

WRQ ([www.wrq.com](http://www.wrq.com)) also updated and renamed its newer host-to-Web product suite. Formerly known as Reflection EnterView, the Java-based terminal emulator is now called Reflection for the Web. Updated to version 3, Reflection for

the Web has enhanced security for over-the-Internet application, offering 168-bit Triple DES encryption and HTTP secure tunneling.

When a user logs on to Reflection for the Web, a Java-based applet downloads from the product's server to the client browser and executes locally. That applet is designed with Java-based API hooks for corporate developers. According to WRQ, those APIs allow developers to use Java, JavaScript, VBScript or HTML to automate logon script, access dialog boxes or build Web-based frameworks around legacy applications.

"[Those APIs] can buy developers time," said Kristen Connor, marketing manager of WRQ's Reflection for the Web software. "If developers get the ultimatum 'Get these applications to the Web,' with Reflection to the Web, without a whole lot of development effort, they can make the applications available to the browser. Then, they can take a more focused approach on going application by application, in terms of rewriting the business logic" into new software.

"We have exposed APIs in Reflection for the Web," Connor continued, "so [developers]

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# Defect Tracker Takes Control of Projects

Subscription service uses Web to centralize developer bug databases

BY EDWARD J. CORREIA

Tracking software through development can be a thorny task. As lists of bugs and program defects pile up, projects can seem out of control, making prioritization impossible. A new product from Pragmatic Software Company Inc. may hold the solution.

Defect Tracker version 2.0 is a Web-based system for storing, viewing and maintaining activities surrounding development projects. But unlike competing products licensed by the user, Defect Tracker is a subscription service. For \$199 per month, developers and managers receive unlimited access to the system with no limits on the number of users or projects.

The Web-based system requires no client software installation, is platform independent and can be activated and maintained online by the subscriber. A demo version can be viewed

at [www.defecttracker.com](http://www.defecttracker.com).

Targeted at quality-assurance professionals, Defect Tracker is suited for both ISVs and for companies developing solutions in-house, according to Steve Miller, president and CEO of the 8-year-old company.

"What I really like is that it's configurable all the way through. For example, status labels can be customized to read any way the developer wishes," Miller said, referring to the labels assigned to software development tasks as they move through the process. "Anywhere there's a drop-down menu, it can be customized," he said.

Defect Tracker provides a series of templates designed to assist in the development process from concept to completion, said Miller. "Templates cover three major areas: functional specifications, test cases and defect tracking," he

said, and defined what the product provides developers from each area. Functional specifications is a space for developers to detail what the final program is supposed to do for users. This space also may be used for a list of contract deliverables.

In test cases, Defect Tracker provides a way to describe methodologies for testing the application as it develops and describes the expected results. Finally, the defect tracker itself stores all remaining bugs, defects and other tasks, along with who discovered them and when, whom it is currently assigned to, and customizable status label. The product also features a customizable reporting system with charting capabilities.

System security is handled by a three-tiered security impersonation approach that avoids ODBC access. Anony-

mous Web users log on to a machine that then attaches to a second machine using an internal logon name and password.

## WORKING IN ISOLATION

Users never have direct access to the file system. "We feel that our system is very secure, and nobody gets rights to directory structure. Anonymous users only, each with locked-down roles," said Miller. Data is further separated by department, which enables subscribing companies to create internal security levels. Individual developers can be set up to see only tasks that are assigned to them, he added.

Himself a programmer and project manager, Miller spent 15 years developing his ideas about what a project-tracking product should be. In 1992, he founded Pragmatic Software ([www.pragmaticsw.com](http://www.pragmaticsw.com)), a con-

sulting firm providing professional software and Internet solutions. Originally developed as an in-house tracking aid, Defect Tracker version 1 was released to the public in 1998. New to version 2 are subscription pricing and the Web-based capabilities.

Miller's first programming job was with Texas-based consulting giant Electronic Data Systems Corp., followed by a job with Perot Systems Corp., and on to Microsoft Corp., where he led a software testing team. The developers at Microsoft used a home-grown tracking solution called RAID, which they apparently loved to hate.

"Everybody complained about [RAID], because it just wasn't very robust," but the Microsoft program furnished Miller with ideas. When Miller began consulting independently, Microsoft was his first client. "One of the reasons I developed [Defect Tracker] was because every place I went they had a need for a defect-tracking system and to be able to communicate," he said. ■

# On-the-Fly-ing Trapeze With iA's Online Docs

BY REBECCA ROHAN

Information Architects Corp. announced the release of Metaphoria, an Extensible Markup Language (XML)-based "dynamic aggregation and syndication" software that exchanges both structured and unstructured data bidirectionally among HTML, XHTML, XML, RDF, ICE, WORD and PDF on the fly.

Using templates and output settings, Metaphoria Converter can carry out instructions for using specific fonts, style sheets or declarative font tags. Information Architects claims the Converter provides backward compatibility to earlier file format versions and is faithful to originating documents. "We were going to use some of the existing filters out there, and they were so bad we decided to build our own," said Bob Gruder, CEO of the company ([www.ia.com](http://www.ia.com)). "It grabs a file, converts on the fly and repurposes to the look, touch and feel you want—XML to brand."

Metaphoria Watcher is an option that detects changes in source documents and automatically updates XML or HTML files based on the

source, but you can suppress updates on documents you want to preserve, Gruder said, adding that Watcher consumes "negligible" resources.

"You don't need call centers anymore, because all the data is available," said Gruder. "You don't need to have a policy and procedure document. You can get that 10,000-page document on the Web and see the changes when they happen."

Syndicator integrates data with different templates, style sheets or other formatting devices to output documents to any Web site or device connected to the Net, Gruder said. The Metaphoria framework uses metadata and takes information directly from the source document and outputs it to the desired format when called for, then relies on Watcher and Converter to update the syndicated material.

Syndicator can allow multiple providers to share digital assets while projecting a custom look for their own Web pages. Affiliates sharing assets can also specify how end-user requests will be handled (for example, HTTP\_REFERER or AOL's USER\_AGENT header).

Aggregator takes information and even functionality, such as shopping carts, from different sources and dynamically produces it at a seamless single point on the Web. "Say you want to launch a Word DOC, PDF file, Oracle data and something out of ERP. You get a seamless, clear look at all four on one page without

frames," said Gruder. "Wireless doesn't support frames. We're the glue—you could transfer [the result] to a wireless PDA."

"It's a way you can conduct business," said Gruder. "If you want to create a business-to-business hub, have all the suppliers syndicate information into that hub, and you can see the costs and whether the parts are available for distribution. You could interface with ERP, first aggregate to get a view,

then syndicate that information back to ERP. You have a frictionless transaction...blending the live data together."

Aggregator is available on Linux, Solaris and Windows NT, and uses the Java servlet API to communicate with Web servers.

Aggregator costs \$35,000 for two CPUs and \$5,000 each thereafter. Syndicator costs \$25,000. Converter costs \$10,000 for each file type you wish to convert. Watcher is \$5,000. ■

## WRQ UPDATES

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can change the look of the application. There is also a tool in the Professional edition which allows developers to change the look of the mainframe or AS/400 application. It's a client-side tool that looks at the 3270 or 5250 data stream and, based on rules, rewrites the look so that function keys become buttons, numbered lists become drop-down lists and so on."

Historically, WRQ wooed IT and network managers with its Reflection products, but now the company will be talking more to application development managers—the decision-makers charged with bringing legacy applications to the Web.

"We've always focused on the IT managers because they've tended to control the network," said Lindsey. "But we know how to do terminal emulation so well that we can add these programmability features and talk to the applications managers."

For example, said Lindsey, now that Reflection 8 includes VBA support, "we'll be going to the VBA shows and the Windows shows."

"You're going to see a new WRQ this year," said Connor. "We're investing aggressively."

## WRQ ACQUIRES SUPERNOVA'S EAI TECHNOLOGY

WRQ recently announced it has acquired the technology and operations of enterprise application integration vendor Super-

Nova Enterprises B.V., enabling its customers to move quickly to e-business operations. With SuperNova, WRQ said it can now offer a comprehensive set of solutions for integrating both legacy host applications and enterprise applications into the overall e-business infrastructure.

According to the announcement, SuperNova's products combine the interoperability of integration platforms and adapters with the strength of application development tools. While these applications comprise almost all back-end applications, the company announced, SuperNova also provides the flexibility to integrate with new "off-the-shelf" applications.

Details of the acquisition were not announced. ■

...only solutions can add some latency,  
...coding usually happens in a user-  
...Internet telephone cards  
...the encoding,  
...and

This means whenever we use the access list  
"MyMarty" in the configuration file, we want to  
specify the host 133.133.1.2 and the network 133.133.2.0.  
The /26 and /32 are the number of bits in the bit mask of  
the IP address. The predefined access lists in KIRA 3 are  
...idwin, Localhost and Localnets.

...IP addresses pertinent to this

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# Getting Active Directory's Number

## IS THIS FEATURE THE MAIN BENEFIT OF WINDOWS 2000, OR ITS MAIN WEAKNESS?

BY LISA MORGAN

Active Directory is going to redefine directory services as we know them. Or so says Microsoft. Is this just more hype from Billville that thickly, yet masterfully, masks underlying real-world technical issues?

Microsoft says no, it's not hype. "Active Directory [is] a consolidation point for reducing the number of directories that companies have," asserted Mark Hassall, Windows 2000 product manager at Microsoft Corp. "Benefits include improved information sharing and common management of users, computers, applications and directory-enabled devices."

According to Microsoft, directories are valuable because they simplify the management of users and resources in a network environment. Microsoft Windows 2000 is extending the role of directories to include security services, directory consolidation and networking, Hassall said. Active Directory "raises the bar for what a directory service needs to be."

Novell Inc., makers of the Novell Directory Services (NDS), says yes, it's hype. "We're excited about Active Directory for Microsoft Windows 2000," said Gary Hein, corporate strategist at Novell. "It represents a great opportunity for us to improve on it. Microsoft's Active Directory is not quite a directory service."

Of course, what else would a competitor say? Microsoft has positioned Active Directory as a centralized directory under which all other network operating system and application directories can run.

The big problem with that approach, Hein pointed out, is the lack of platform support. "How can you offer a true enterprise solution if all you support are Windows 2000 servers?" he argued. He stressed the lack of Linux and Solaris support for example, adding, "[Microsoft is] not really supporting NT either. To get the benefits of the new Active Directory, you need Windows 2000 servers."

The Windows 2000 server includes Active Directory and the Active Directory Services Interface (ADSI), the Windows Open Services Architecture

Messaging API (MAPI) and LDAP C API. Hein said, "Developers are rejecting ADSI in favor of LDAP [because it's an industry standard]."

What about NT migration? Clearly it's a big issue facing developers.

Microsoft's Hassall said in regard to Active Directory, there are two ways of migrating from Windows NT to Windows 2000 Server edition: upgrade and restructure. Upgrading and restructuring are not mutually exclusive operations, he pointed out. You can upgrade first and then restructure, or

restructure and then upgrade.

"Upgrade is the easiest, least-risk migration route," he said. "You can define domain upgrade as the process of upgrading the software on the Primary Domain Controller (PDC) of a domain, and upgrading some or all of the Backup Domain Controllers (BDCs) from Windows NT 4.0 to Windows 2000 Server." According to Hassall, Windows 2000 supports Windows 9x, Windows NT 4 and Windows 2000 with full interoperability among networks. "Not all systems in the domain have to be upgraded to

take advantage of Windows 2000 features," he asserted.

Hassall went on to say that upgrading the PDC should be considered only the first upgrade step. To get the benefits of Windows 2000, BDCs should also be upgraded, and subsequently Member Servers. When all the servers are upgraded, then users can get complete access to advanced Windows tools and features.

The purpose of domain restructure is to provide customization, so that directories can be structured to suit an organization's unique needs. The result, said Hassall, "is usually some rationalization of the current structure and perhaps a move to fewer larger domains."

Hassall said that in the past,

third parties have provided directory management tools, but that for the first time, Windows 2000 provides native functionality that enables domain restructuring scenarios. For example, security principals can be moved from one domain to another while maintaining access to resources. Further, domain controllers can be moved from one domain to another without complete reinstallation of the operating system.

Hein countered, saying: "Microsoft's tools are weak. Tools are important. You should be able to add more objects in a tree and merge objects together. There's a great deal of opportunity for third-party developers to develop

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## 411 ON ACTIVE DIRECTORY

Microsoft Corp.'s Windows 2000, its replacement for Windows NT 4, shipped to customers on Feb. 17.

This long-awaited, updated operating system contains much that's improved over Windows NT: a better user interface, better stability and fewer Blue Screens of Death, better management tools in the server version, better support for laptops and Universal Serial Bus in the workstation version, now named Windows 2000 Professional. But many of these changes are evolutionary, not revolutionary—and quite a few of them are mainly cosmetic.

But there's one feature that really *is* new to Microsoft's operating system: an internal user, applications and network resource database called Active Directory, which drastically changes the way that users and devices find each other and work with each other. An understanding of what Active Directory is, and what it can do, is key to understanding Windows 2000 and to making a decision about deploying this operating system.

Active Directory replaces Microsoft's domain system. In Windows NT 3.51 through NT 4.0, Windows NT servers, users, printers and other network resources were assigned to *domains*, each controlled by a server called the *domain controller*.

### IF THE SHOE FITS

A small company, Shoe Corp., might have a single domain,

SHOECORP. A bigger company might have several domains based on physical locations, such as NY-OFFICE and LA-OFFICE. An even bigger one would have multiple domains in each location: NY-SALES, NY-MFG and NY-ACCT for sales, manufacturing and accounting. A huge company might have dozens of domains and domain controllers.

The problem is that domains don't scale gracefully, because each domain maintains a separate database of its users and access privileges.

Therefore, if a user wants access to more than one domain's resources, administrators had to either manually create (and maintain!) separate accounts in each domain for that user, or create so-called "trust" relationships between domains, which says that any user of one domain has full and complete access to another domain. For security purposes, that's not a particularly attractive option.

Say a user was part of the New York software-development department but occasionally worked out of the Los Angeles office. In order to have access to local printers, servers and other resources on the Los Angeles LAN, the site administrator would need to provide a separate Los Angeles computer account and synchronize it with the user's New York account. That sounds easy for two domains, but think about a company with dozens or even hundreds of them.

Furthermore, it is difficult to transfer resources from one domain to another; because all the domains were separate, moving the user and his or her data and access privileges from the NY app-dev domain to the LA sales domain would be an administrative nuisance, and one that's easy to get wrong.

### BRING IT TOGETHER

Enter Active Directory, or AD, which is an enterprise-wide database of resources. It's designed as a hierarchical tree, in which everything on the network—servers, users, printers, tape drives, files, you-name-it—has a unique name and unique location in the Active Directory. A business's AD database builds off of a *root*, usually the company's Internet domain name. For our example, that would be *shoecorp.com*.

Different qualifiers are added to the front of the root, going into increasing levels of detail. Everyone in the sales department would belong to *sales.shoecorp.com*. Thus, a user's unique ID might be *susan.smith.appdev.shoecorp.com*.

If Susan needs to use Los Angeles printers or servers, all the administrator has to do is add permissions for those devices to her existing Active Directory listing. There's no need to set her up with accounts on both networks.

And if she moves from the applications-development to the line-of-business department, a network administrator sits at a single console and just drags and drops her account

from *appdev.shoecorp.com* to *lineofbiz.shoecorp.com*, and she now has access to the line-of-business servers and loses access to the source-code servers.

### MORE THAN URLS

Don't let this simple example imply that all Active Directory does is rename domains using Internet-style URLs. It's potentially much more than that.

Remember, it's a *single resource database* for the entire network. All the domain-name model knew about its users was whether they were allowed to log on to a particular domain, if they were users or administrators, and which computers, disk drives and printers *on that domain* you could use.

Other network applications that needed to store information about users, such as Microsoft's Exchange e-mail server, needed to maintain their own databases to, say, match names with e-mail addresses. Keeping those databases synchronized with the domain databases was a real nuisance.

What does this mean for developers? Applications can store user information right in Active Directory, rather than maintaining their own directories. If necessary, those apps can extend the Active Directory database schema to include data specific to the application's needs. The flip side is cross-platform portability. If your apps exploit Active Directory, they'll be tightly coupled into Windows 2000 or future Windows platforms.

—Alan Zeichick

◀ continued from page 10  
value added tools.”

As you'd expect, Microsoft disagrees, saying that Active Directory allows developers to build powerful directory-enabled applications that deliver greater functionality and enable lower total cost of ownership (TCO). According to Microsoft's Hassall, there are six major features of Active Directory of interest to developers, including group-policy integration, service publication, directory-object extension, the ADSI extension model and Active Directory class store.

#### SETTING THE POLICY

Active Directory's Group Policy enables network administrators to match users with network resources. Policies define applications and configurations based on an employee's role in the company, as well as assign users to domains and security groups. This provides for easy deployment of new resources to subsets of network uses.

Microsoft's Hassall said flexibility is key. “When a user is moved into an organization or added to a Windows security

group, his or her applications can be installed and configured automatically, helping to lower installation and configuration costs dramatically.”

Novell's Hein argued that there are problems associated with groups. “There are some fundamental flaws in Active Directory, particularly with the replication of group objects, security policies and group policies,” he said. “If two people modify the same object [prior to Windows 2000 updating those changes], the changes are often lost.”

Service publication is also a feature of Active Directory 2000, as is direct-object extension. Service publication enables applications to publish the names and locations of services they provide so that clients can locate them dynamically. Direct-object extension allows applications to add new types of objects and to extend existing ones.

With the ADSI extension model, application developers can associate Common Object Model (COM)-based business rules with objects stored in Active Directory, according to Microsoft's Hassall. “This pro-

vides a consistent and simple way for developers and administrators to interact with an application and its objects. The Extension Model also makes it easy to invoke methods across groups of objects, such as ‘all users in the Accounting department’ to simplify administration.”

Active Directory stores the names and locations of COM objects installed on the network in a section of the directory tree called Class Store. Hassall said COM uses the Class Store to locate and install the COM objects that users are allowed to use on their machines automatically. “This can lower the TCO of COM-based applications by simplifying client configuration and administration,” he said.

#### BIG PROBLEMS, ACCORDING TO NOVELL

The biggest problem Novell's Hein attributes to Active Directory for Microsoft Windows 2000 is a matter of upgrade vs. redesign. “Microsoft should have started over,” he said. “Active Directory for Windows 2000 is an upgrade that's not even compatible with NT or Windows 95/98. We threw out

our directory design once. We built a new directory service and then made it backward compatible. That's what Microsoft should have done. You don't create a plane by adding wings to a car. You design a plane that flies and then figure out a way to land it safely using wheels, like the ones they have on cars.”

As of Feb. 1, Hassall said, Baan, J.D. Edwards, SAP and Cisco had committed to supporting Active Directory. By Feb. 17, the company demonstrated broad support from 10 global launch partners and a number of smaller partners. All of those players are supporting Active Directory under Windows 2000—because that's the only place it runs.

“Do you think Microsoft's talking to Sun about Solaris?” Hein asked.

#### A FEATURE, NOT A BUG

Two days before the launch of Windows 2000, Novell pointed out a potentially serious security flaw in Active Directory. The flaw, described at [www.novell.com/advantage/nds/ad-security.html](http://www.novell.com/advantage/nds/ad-security.html), allows administrators to access any objects on the net-

work, even when they had been previously denied access.

Consider the scenario Novell describes: Because some departments, such as payroll, have sensitive information to which access must be restricted, Active Directory provides mechanisms for restricting access through the use of ACLs (access control lists).

However, says Novell, administrators can override an object's ACL, even if their names aren't listed within the access control list. They do so by taking “ownership” of that object; as the object's owner, they have full access to the ACL. Once they become owners, they can add their name to the ACL, and then begin using the resource.

Shortly after Novell's account hit the Internet, Microsoft responded on [www.microsoft.com/Windows2000/bulletins/novellresponse3.asp](http://www.microsoft.com/Windows2000/bulletins/novellresponse3.asp). This page downplays the security hole, saying that this is a feature, not a bug: “Microsoft believes, in real organizations, there are excellent reasons why an administrator should be able to reclaim ownership and control of an object.”

Novell, clearly, disagrees. ■

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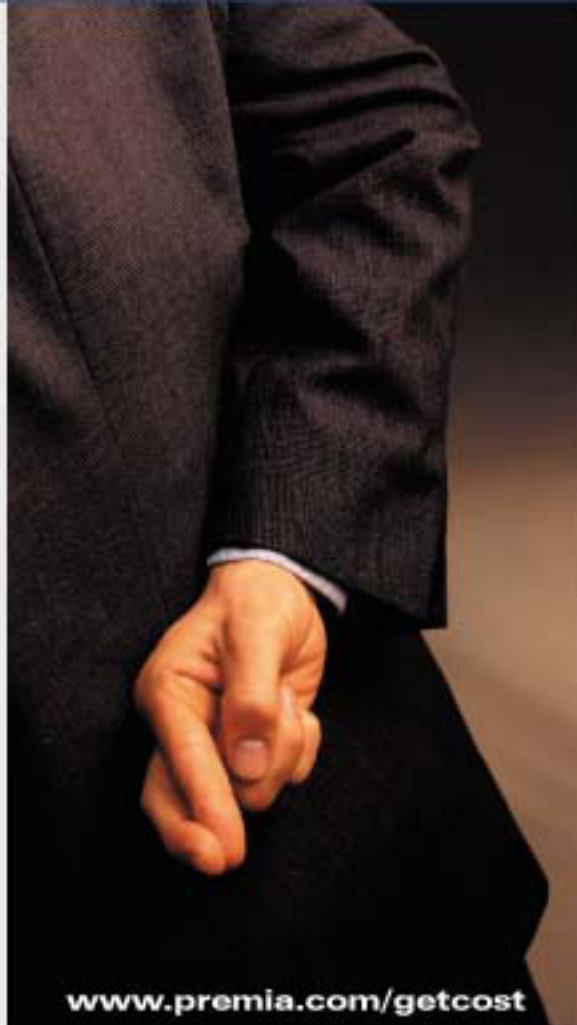
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# Shopping Cart Security Holes Leak Real Dollars

ISS names 11 shopping carts vulnerable to form tampering by online buyers

BY REBECCA ROHAN

The "X-Force" team at Internet Security Systems Inc. issued a security alert detailing Web shopping cart vulnerabilities that allow shoppers to lower price tags and jack up discounts as they waltz out of online stores.

The recent announcement from the security management solutions provider named 11 e-commerce vendor shopping carts they deemed vulnerable. While some of the carts have been fixed or improved, that list is less important than assessing any software that allows users to submit information over the Web, whether you're buying it or unleashing it from the lab.

The class of form vulnerabilities causing the problems is not new, but ISS (www.iss.net) has been watching the shopping cart industry during the growing e-commerce rush, where the consequences of sloppy programming are measured in obvious dollars and cents. The culprits are sometimes hidden fields in HTML forms that hold the parameters of goods, including prices and discounts. While the HTML form containing the price of an item sits on a shopper's machine, he can edit the price and submit the altered form, which the shopping cart passes back to the system.

Other breaches occur when a price appears in a URL, which the shopper alters before it's picked up by the CGI script and entered into the system. Still others depend on an HTTP header that can contain an altered referrer.

## STOP THE BLEEDING

In its Feb. 1 announcement, ISS recommends upgrading to fixed versions of vulnerable software and, where that's not possible, verifying the price of each item ordered in the shopping cart application database or e-mail invoice.

David Sarjantson, product manager for Axent Technologies Inc. (www.axent.com), an e-security solutions provider, pointed out further dangers. "In a URL, you can have embedded information that includes maybe a credit-card number or billing information—the referrer field has been around in HTTP and shows the URL of where the document last came from. If a hidden field was in it,

and a page pops up as a result of that, when someone receives a confirmation page, they could have a look at the HTTP information that came with it. They could get the names of machines, IP addresses and so on—and that kind of information doesn't even get picked up by the firewall. It can be quite dangerous," he said.

"Developers should be looking at what hidden fields are used," Sarjantson continued. "Be careful a referrer field does not contain anything you don't want exposed. You might consider a hash function to make sure the information hasn't changed—to check that those hidden fields remain constant."

Sarjantson emphasized the importance of having an experienced programmer on the team who knows which "little things" to beware of, such as using the GET method instead of POST. "The GET method and the URL vulnerability go hand-in-hand," said Sarjantson. "Switch to POST."

Another place to look: "When the user switches between HTTP and HTTPS—is there a vulnerability going back to HTTP?" asked Sarjantson. "They're going from secure to insecure. All of these checks are relatively easy for developers to go through."

"A lot of developers neglect the fact that the Web and the Internet are insecure to begin with," said Sarjantson. "They want to deliver to a tight schedule, but some aspects of security they believe are there don't exist at all."

"It's definitely a development issue," said Bill Orvis, security specialist with the U.S. Department of Energy's Computer Incident Advisory Capacity Team (www.ciac.org). "If you build your pages from the prices stored on your Web server instead of using prices sent to you by the user, then you shouldn't have this problem. With every single one of these vulnerabilities, you have stored data on the client," said Orvis. "The thing to do is not store it on the client. Store a cookie on the client so you know who he is, but store the actual data on your own server."

Sarjantson said if there's a third party involved, you might have to expose information, and

he suggests checking to see that fields haven't changed. He would also consider expiring the Web page when a certain amount of time has elapsed since the last transaction. "Make the user fill out another form. Make it clear that they have to finish within a certain time."

## BEYOND THE SHOPPING CART

Form-tampering vulnerabilities could be exploited in places besides shopping sites, according to Orvis. "When you're developing Web sites of this type, think about who has access to the information and imagine what would happen if they changed it," said Orvis. "This will lead you to discover holes in your design. I've discovered big holes doing that. If you store a prescription on

somebody's Web browser, they could change it to anything," said Orvis, though he was quick to add he doesn't know of any drugstore sites that operate that way.

Ann Marie Beasley, product group manager for Axent, said managers need to make sure

security is a fundamental building block of development, despite the rush to launch. "Consider security assessments, intrusion detection mechanisms, authentication and access control mechanisms—they all need to be a fundamental part of the solution." ■

## ELEVEN SHOPPING CARTS, 45 DAYS

ISS's "X-Force" named 11 shopping carts that had form vulnerabilities. ISS said in the 45-day period following notification of the cart vendors, only one product "completed securing vulnerabilities": Adgrafix Corp.'s Check It Out (ssl.adgrafix.com).

ISS said seven had improved security: @Retail Corp.'s @Retail (www.atretail.com), McMurtrey/Whitaker & Associates Inc.'s Cart32 2.6 (www.cart32.com), CartIt Corp.'s CartIt 3.0 (www.cartit.com), Make-a-Store's OrderPage (www.make-

a-store.com), ComCity Corp.'s SalesCart (www.salescart.com), BizCom International's SmartCart (smartcart.com) and Web Express' Shoptron 1.2 (www.shoptron.com).

Forty-five days after the notification, ISS said that three vendors had not provided fixes: Crested Butte Software's EasyCart (www.easycart.com), Intelligent Vending Systems' Intellivend (www.intellivend.com) and Baron Consulting Group Ltd.'s WebSiteTool (www.websitetool.com). —Rebecca Rohan

## XBRIDGE TRANSPARENTLY CONNECTS THE OLD AND THE NEW

Tool links Windows 2000, Web servers with OS/390 data

BY EDWARD J. CORREIA

Even with all the technological advances in the past 10 years, the world still cannot seem to rid itself of those pesky mainframes. Helping to bridge the gap between modern systems and legacy data are a host of middleware solutions, the latest of which is Xbridge Professional from Xbridge Systems Inc. of Sunnyvale, Calif.

Xbridge Professional is designed to give developers a way to create real-time links to data residing on IBM's OS/390 mainframes and present it to standard applications on machines running Microsoft's Windows 9x, NT and 2000 using standard development environments including OLE DB/ADO or Visual Basic. Previous micro-to-mainframe links

required time-consuming intermediate steps, such as message brokering, data replication or migration, which made real-time access difficult, according to the company.

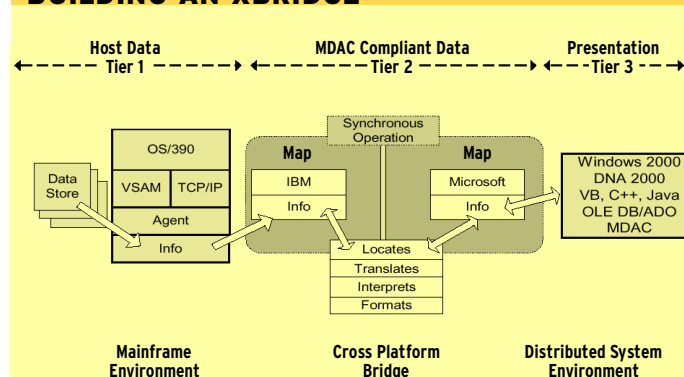
"A developer does not have to worry at all about the mainframe data," said Kevin Murphy, president and CEO of Xbridge Systems. "Once the template is set up for the data, it becomes Windows data, so the application thinks it is talking to Windows data off of a local server," he said. After initial setup, a developer or systems person sitting at a Windows machine runs a GUI and selects which fields of mainframe data are to be used, Murphy explained.

Targeted at any organization using Windows and OS/390

machines, the product takes a three-tiered approach to the legacy access problem. The mainframe component sits on the OS/390 data store and acts as an authorized component. This module uses a Resource Access Control Facility, the IBM OS/390 security method, to assure the integrity and security of corporate data, according to the company. Mainframe data can be stored by the Virtual Storage Access Method or by the Queued Sequential Access Method, and can be accessed by record or by individual fields. The server component for Windows NT or 2000 servers establishes the mainframe connection, performs EPSIDIC-to-ASCII data translations and the handling of multiple client access requests. A Win32 client agent maps data from the server and presents it to the requesting application.

The product is available now directly from Xbridge Systems (www.xbridgesystems.com); usage-based pricing starts at \$20,000. Included with the current version are text, OLE DB/ADO and data ActiveX formats. The company is scheduled to begin offering support for HTML, Dynamic HTML, XML and Java Script later this year. ■

## BUILDING AN XBRIDGE



## FLASHLINE TESTS

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ing/selling/marketing milieu by offering IT managers—as well as developers/vendors—professional-level checks for structure, performance, server-side capacity and even custom attributes. Flashline uses testing tools under recent agreements with such vendors as Metamata Inc. and KL Group Inc.

In one tools deal, Metamata (www.metamata.com) will receive royalties for Flashline's use of Metamata Metrics, which assesses global complexity. "If the complexity of a piece of code is high, one possibility is to change that code—or to allocate more resources to testing it," said Sriram Sankar, Metamata's president and CEO.

Sankar said keeping down the complexity "helps the process of turnover from one programmer to another," and added, "If you measure complexity on a daily or weekly basis, and you see something changing very rapidly, you need to take a closer look. Maybe a software engineer did not follow programming guidelines

and is doing something in an ad hoc way. This allows the manager to keep track of what the programmer is doing and help them maintain the quality of the software."

Another tool, Metamata Audit, will check Java source for style, programming errors and performance against a set of



**You can say your code passes the Flashline test, said company president Charles Stack.**

standard coding practices. Flashline will use J2EE, which includes the ability to program custom checks through an API. Stack said custom tests will occur on a client-by-client basis: "If they have a set of their own parameters—that would be part of the subscription service."

KL Group (www.klgroup.com) will contribute the JProbe Developer Suite, which includes a code profiler and memory debugger; JProbe Threadalyzer, which checks deadlocks, stalls and race conditions; and

JProbe Coverage, which finds and measures untested code.

Stack ran down some of the questions addressed by the three tool sets:

First, "Is your code well-formed? Naming conventions, stylistic issues—all that goes to maintainability. How many objects do you have? What's the number of properties per class, classes per component, dependencies on external components, depth of inheritance?" asked Stack. The lab will explain the rule that was broken, the rationale for the rule and ways to fix the problem.

"Once you have reasonably well-formed code, how well does it perform?" asked Stack with regard to the second type of testing. "Where are the functional bottlenecks?"

The third type of assessment is load testing for server-side components. "How many users will it support?" Stack asked.

Flashline currently supports six server types and will be adding others. "There will be platform options where you can say, 'Run this on' a particular combination of hardware and software," he said.

### BREAKING THE NEWS

When tests reveal problems, the news goes back to the party submitting the code for evaluation, but "we will have an option, probably not in the first release, of results going to a third person," said Stack. "Then [the client] can segregate development from quality assurance."

Flashline may refer clients to rules that apply to errors, but, said Stack, "there may be situations where we're wrong—in the sense that there can be good design reasons for having software that's outside normal metrics." Flashline might say, "Here's what the problem is, what it means and how to fix it," but the developer might say, "I know, but here's why I did that." Management would be aware of such situations and have input from both the test side and developer side to evaluate the next move.

Flashline doesn't seem to be eating Sun Microsystems Inc.'s lunch, at least according to Ann Betser, Sun's senior product manager for Enterprise JavaBeans, who said that Flashline "is further proof that this market is taking off."

Stack said the outsourced quality assurance will prove useful to in-house developers and to software vendors who can say their components "passed the Flashline tests," and to developers bidding for jobs on Flashline's Components By Design area. Stack also sees the QA as advancing the technology. "To create a truly reusable marketplace, the quality needs to be guaranteed," he said, adding, "Reuse is still more of a dream than a reality for most people, but it's clearly the right way to go—and where everybody is headed."

This month, customer Diamelle Inc. is scheduled to release JavaBean components designed for order processing, said its CTO, Suneet Shah. "We have an agreement with Flashline to market our products through them, and the testing will also be helpful. It helps us internally because there's another body that's doing testing, which gives us a higher comfort level. And it helps ensure a certain level of comfort to the buyers, in that the EJB have been benchmarked and that they will operate a certain way." ■

## Meet the Database Developer's Boss

**A**fter all these years, he still gets a rush from entering the data center. As a database developer in the early 1980s, he cut his teeth on IBM System/370 mainframes and CICS. Today, the department he manages uses System/390s for heavy lifting, while also building new applications using a three-tiered model with Oracle running on Solaris on the back end.

The transition from dumb terminals to client-server to the Internet isn't as crazy as it seems. One thing that hasn't changed: the too-short deadlines. When the CIO wants a new feature, she wants it yesterday... and that's particularly true with latest Web initiative. Allowing customers to read their account status is easy. Allowing them to update those records in real time is no picnic. That's why the RFPs he's been sending to middleware vendors stress that all suppliers have to provide solid mechanisms for ensuring the integrity of the primary customer database. Plus the ability to access the multitude of databases that have cropped up over the years.

The technical journals? He's long past the days of writing SQL queries or building tables — his job is to guide his company's progress by directing the development teams. He needs a wide-angle view of the entire spectrum of application development tools. Product roadmaps, not how-to tips and tricks. He needs to know the trends, the products, the alliances, the NEWS and what it all means. That's why he reads SD Times.



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John Glenn  
— U.S. Senator and  
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# Microsoft's Unfolding Embedded Strategy

## The road ahead for Windows CE and Windows NT Embedded

BY LISA MORGAN

"Windows on every desktop" is an antiquated notion, according to Vince Mendillo, lead product manager in Microsoft Corp.'s Business and Enterprise Division. "Windows in every home" is the new mantra, reflecting Microsoft's focus on solutions for any devices other than PCs. The shift really translates to Windows everywhere, on street corners and factory floors, in homes, offices, cars, ATMs and wireless communication devices. For developers, Microsoft's embedded operating systems represent a whole new world of opportunities.

Mendillo and his colleague Scott Horn, group product manager for Windows CE, love using the words "devices" and "appliances" as they talk about Windows CE and Windows NT embedded applications.

The difference is, Windows CE-based devices are typically those that require power management, instant-on capabilities and a small footprint, such as those required by cellular phones, intelligent pagers and handheld computers.

By comparison, Windows NT Embedded-based devices use the full Win32 API, advanced file systems, Simple Network Management Protocol (SNMP) and other comparatively sophisticated features, and require as powerful a computing platform as standard versions of Windows NT 4. Devices built with this operating system are envisioned to be point-of-sale systems, printers, copiers and server appliances.

"We're focused on both PC

and non-PC devices now," said Mendillo. "Our strategy is to create a standard platform for embedded devices and servers that enables a persistent connection regardless of the environment. The point is to be able to get access to information anytime, anywhere."

Microsoft's three-pronged embedded strategy includes what Mendillo called "persistent connectivity." The other two elements are support for various form factors (PC and non-PC devices) and support of objects such as those used in smart cards. In other words, Microsoft is attempting to enable "Windows everywhere" quite literally. As a result, Windows is becoming a popular solution not only for personal and enterprise computing, but also for set-top boxes, smart cards, batteries, intelligent street signs, bar code scanners and Internet access devices.

### 'POST-PC ERA' DAWNS

Ron Workman, senior vice president of Insignia Solutions Inc. (www.insignia.com), agreed that appliances of all kinds are where the market is heading. His company provides Java solutions that run on top of various operating systems, including Windows CE and Windows NT Embedded.

"We're heading into the post-PC era," said Workman. "Traditionally the [PC desktop] strategy has been more, better, faster. We're moving away from that sort of complexity where everything resides on the PC. Now we're seeing a proliferation of appliances that reflect

the Java 'write once, run anywhere' notion."

The ability to plug non-PC devices into existing desktop and server infrastructures is extremely important, and one of Microsoft's priorities. Devices are becoming more intelligent, often exhibiting almost PC-like capabilities. Although the extended functionality may be valuable in a stand-alone environment, the real value lies in the ability for devices to com-



Where's the Windows CE market heading? Toward appliances, according to Insignia's Ron Workman.

municate with each other and share information in a networked environment.

"There is a wealth of Windows NT and CE applications out there written to the Win32 API," said Mendillo, pointing out that application portability is also valuable.

Workman agreed that communication between devices and applications is important. He cited mobile applications such as sales-force automation as well as the emerging integrated systems and services that bring traditionally disparate solutions together for the users—like the new cars with navigation systems that also enable the drivers to make dinner reservations.

### IT'S STILL A PC

George Henne, president of NS Basic Corp. (www.nsbasic.com), asserted that a PC by any other

name is still a PC. "These devices really are computers. Any application that runs on a desktop can run on CE." Henne's company offers a BASIC interpreter and toolkit that runs natively on Windows CE. By comparison, most Windows CE development environments run on Windows NT workstations, with compiled apps then installed on Windows CE.

Microsoft is working with a number of partners to help them build targeted products designed to address a particular application or market.

Sometimes what results from these partnerships benefits the Windows developer community as a whole, such as DirectX components that give developers access to sound and graphics hardware. Mendillo said Microsoft is actively working with OEMs, semiconductor manufacturers and partners to extend Windows out to yet more markets.

For developers, the extension of Windows into new markets represents a plethora of career opportunities, according to Mendillo and Horn. They said many Windows PC developers are being recruited by appliance hardware and software vendors because they already know Windows.

### FROM WIN32 TO EMBEDDED

"There's more demand for software developers in the embedded space than ever before," said Mendillo. "We want to leverage PC developer knowledge for the embedded marketplace."

Toward that end, Mendillo

said, Microsoft is offering a rich set of APIs and development tools. The company also is providing a common set of APIs for Windows CE and Windows NT Embedded that helps shorten time to market. Last, but not least, the company is focusing on partner relationships to further decrease developer time to market as well as provide more comprehensive tools and solutions.

BSquare Corp. (www.bsquare.com) is one such partner. The company provides tools, applications and services that enable developers to slash the development times of Windows CE, Windows NT and Windows NT Embedded applications for all types of PC and non-PC devices.

"CE and NT represent explosive markets," said Jeff McLeman, chief technology officer of BSquare. "[The market for non-PC] appliances will be 10 to 20 times larger than for PCs because we'll all have two or three of these devices—like intelligent refrigerators and set-top boxes—in our homes, in addition to PCs. All these devices are going to be networked. It's going to be like *Star Trek* minus the transporter and warp drive."

NS Basic's Henne sees a lot of opportunity for CE devices in technologically underdeveloped nations that don't have reliable power systems. "They may not have access to reliable power, but they have access to AA batteries," said Henne. "You can get a CE unit and develop applications on it."

### WINDOWS CE 3.0 IN 2000

Microsoft will release Windows CE 3.0, code-named "Cedar," later this year. (Many embedded systems are currently being designed with Windows CE 2.x.) Horn claimed Microsoft is being successful in getting "very well-known OEMs" to adopt the Windows platform. He said Windows CE 3.0 will be a significant upgrade that will work with Windows 2000 and that Microsoft will be announcing an embedded version of Microsoft Windows 2000 later this year.

"All these operating systems have their place," said BSquare's McLeman. "We'll provide solutions for all of them. The biggest opportunity comes from the Win32 API and a base of five million Windows programmers." ■

## Red Hat, Intel Give Embedded Itanium Developers a Running Start

With the recent release of GNUPro Tools for IA-64, Red Hat Inc. claims to be the first to offer a development environment for Intel Corp.'s forthcoming Itanium microprocessor, formerly code-named Merced.

The new tools will permit embedded and native developers to begin creating applications prior to the production of the new Intel processor, according to an announcement made at the Intel Developer Forum in Palm Springs, Calif.

In a further show of support for the long-awaited 64-bit chip, Red Hat Inc. (www.redhat.com) last month released the source code for the Linux operating system port to IA-64. The newly ported operating system is included with the GNUPro tool kits for IA-64, along with the GNUPro compiler and debugging tools.

According to company reports, this marks the first time that development tools and a Linux kernel are available for a preproduction Intel processor.

In keeping with the Linux tradition, the new tools will be distributed according to the open source software model. They are available for download at www.redhat.com/ia64.

With the release of the Itanium processor, Red Hat plans to offer packaged and supported tools that it will bundle with its Linux kernel.

The company will also offer installation support via e-mail along with an annual subscription service for obtaining product upgrades and new tools

through a priority FTP account.

Of course, Red Hat isn't the only company working on IA-64 operating systems and tools. Intel's Itanium Web site, <http://developer.intel.com/design/ia-64/devinfo.htm>, describes numerous projects under way, ranging from Microsoft's Win64 (Windows 2000 64-bit) to Hewlett-Packard's HP-UX to 64-bit Linux.

Last year, Intel also created its own venture fund, designed to jump-start the development of Itanium projects. ■



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# Advertising in Software

# In Embedded World, Small Is Big

Scenix VM claimed as 'smallest programmable virtual machine' available

BY EDWARD J. CORREIA

Scenix Semiconductor Inc., the self-proclaimed leader in the movement to embed the Internet into everything, hopes to make the job a bit easier with the release of the Scenix Virtual Machine, which occupies 3K 12-bit words of on-chip program memory, making it the smallest programmable virtual machine available today, according to the company.

Targeted at Web-connected kiosks, servers and other Internet appliances, the small-footprint microprocessor emulator is designed to be used with the company's own SX series communications controller chips and, according to Scenix, will turn in an execution rate of between 100K and 1M bytecodes per second on a 50MHz 50MIPS Scenix SX52BD controller.

The reason for the variation is because Java bytecodes take a varying amount of time to execute," said Chris Waters, principal software engineer at Scenix

(www.scenix.com), "and performance depends upon the number of peripheral functions [being] run at the same time," such as multiple UARTs, which will take some MIPS away from what would be available to execute the Java bytecode, he said.



**You can get high performance with embedded Java, according to Scenix's Chris Waters.**

Citing a lack of benchmarks for measuring Java execution performance on embedded systems, Waters compared the Scenix VM's 1MIPS maximum execution performance to that of an 8051 microcontroller, "which might run 2 MIPS programmed in assembly language. So you're executing in Java and getting performance which is not that much worse than what you're getting in a typical microcontroller."

When the 3K Scenix VM is used in conjunction with the SX52BD chip, which includes 256 bytes of SRAM and 4K 12-bit words of flash program memory, the remaining 1K memory may be used for loading Virtual Peripherals, such as those providing I/O functions, obviating the need for a dedicated chip. "[Developers] get the added benefit of developing with high-level interfaces of Java," Waters said, "which is much easier and faster than developing them in assembly [language]."

Based on the Java Card specification published by Sun Microsystems Inc., the Scenix Virtual Machine is compatible with any Java compiler, integrates with Java Virtual Peripherals and includes Java object-oriented features such as inheritance, polymorphism, exception handling, static fields and methods, Waters said.

Java Card features absent from this optimized VM include garbage collection, multi-

threading, floating-point capabilities and long data types—features that Waters said were relatively minor for embedded systems. A Java Card-compliant version is under development.

The Scenix Virtual Machine is available to developers in two parts. The Windows-based IDE and debugging environment, called Javelin, includes the Java Virtual Machine built into a Scenix SX chip, along with some commonly used hardware

functions executed in software, including I/O.

The company said Javelin is suitable for device prototyping, but does not include VM source code. For that, developers must pay a one-time fee of \$25,000, for which they receive the Scenix Virtual Machine source code and documentation on its internal workings. Javelin pricing is not yet set but is estimated to be less than \$1,000. Both products are available now. ■

## SCENIX CHAIRMAN SLAIN

Scenix Corp. executives were shocked by the unexpected death recently of Steven Leung, the company's chairman. Leung died from injuries sustained after being beaten in a karaoke bar in Beijing on Jan. 18, according to police reports received by the family. Leung was treated at a local hospital and flown to the U.S., where he succumbed, it was reported.

"He was a friend of the company, and it is a great personal and emotional loss to many of us here," said Bulent Celebi, president and CEO of Scenix,

which is based in Mountain View, Calif. Leung was 52.

Along with his management team, Celebi has been running the company since Leung, a co-founder of Scenix, brought him on to assume his current duties in January 1999. "The death of Leung will have no direct impact on the operations of the company," Celebi said. Leung had left the company and had started his own venture, an e-commerce start-up business, and was in China to attend the ChinaEcom.com conference. —Edward J. Correia

## Premia Estimates Project Costs

CostWright helps managers keep in control

Premia Corp. announced this week that CostWright, its new software project cost-estimation tool, will be available later this month.

Premia (www.premia.com) decided to launch CostWright in the wake of several reports that show a success rate for project development—meaning a project completes on time and under budget—at around 20 percent, according to CostWright's product manager, Mark Weisgerber.

"Project managers have gone on a gut feeling, or polled their teams of developers," said Weisgerber. "CostWright gives them a tool to take a large historical database of projects that is updated periodically and gives more refined estimates."

CostWright is a self-standing application that runs on Windows but can estimate projects being developed on or for any platform. Also, the product will export its database to any project management tool that can import an MPX file, Weisgerber said. The price has yet to be determined.

Among CostWright's features is the inclusion of seven

different methods of doing estimates. This allows project managers to pick and choose, as one estimator might work better for an embedded systems project while another might be a better selection for a general server application.

"The tool should have a plus-or-minus-5-percent accuracy rate depending on the accuracy of input," Weisgerber said.

Premia also plans to offer training courses to help managers refine their knowledge to define projects, Weisgerber said. The courses will be offered at an additional cost to the software.

CostWright also can assist with "what-if" scenarios, Weisgerber said. If a manager runs the program and realizes the time frame might take too long, he can cut a feature and get a new estimate of time or cost.

Of course, project failures are not always the fault of the development team. "This tool will help a project manager to make a case for a reasonable time frame [to complete the project] and budget," Weisgerber said. ■

## TRANSMETA SAYS, 'IF WE BUILD IT, OEMS WILL COME'

Crusoe's low-power consumption 'ideal' for mobile developers

BY EDWARD J. CORREIA

As the dust around Transmeta Corp.'s recent Crusoe processor release begins to settle, OEMs are left with the decision of whether to invest in developing prototypes using a new technology and a new company, or to stick with their established suppliers and methods.

According to Transmeta Marketing Director Ed McKernan, developers will be attracted to the Crusoe circuits over those of established companies because of their suitability to task. "The PC market of the future will be toward mobile Internet computing and away from desktops," he said, adding, "Crusoe is the best platform for a full range of devices." Crusoe processors will be fabricated by IBM Corp.

"We have created something unique," McKernan said of the company's low-power x86-compatible mobile processors. "The way we look at the \$500 to \$1,000 PC market today, there is no mobile device that is successful. As [Crusoe-based] devices begin to be released in the second and third quarters, we believe we will be validated."

Transmeta (www.transmeta.com) has been tight-lipped about its customers, revealing only that S3 is developing a WebPad-style device using the Crusoe chip.

The Crusoe model TM3120, claimed to be equivalent to Intel's 333MHz Pentium II processor, has been optimized to run mobile Linux and is recommended for handheld devices. The TM5400 is designed for ultralight notebooks and palmtops and runs Microsoft's Windows at speeds equivalent to a 500MHz mobile Pentium III, according to Transmeta.

The processors require about one-tenth the power of their mobile Intel or AMD counterparts, said McKernan, and cited that Intel's forthcoming Willmet mobile processor will consume about 60 watts of power compared with Crusoe's 1 to 2 watts.

The TM5400 will be available in 500MHz and 700MHz speeds, which will sell for \$119 and \$329. The 333MHz TM3120 will cost \$65, and the 400MHz version will sell for \$89.

The new chips have similar

power characteristics of StrongARM and MIPS processors but with the performance capabilities of Intel or AMD chips, McKernan said. "The problem with the StrongARM and the MIPS is that they don't run the Internet applications like the Adobe Acrobat plug-in, the RealAudio, RealVideo, Macromedia Flash-type plug-ins. This is where having an x86 processor with an x86 operating system like Linux really shines," he said.

The secret to this achievement is the migration of about 75 percent of the logic transistors to software, plus Code Morphing, a process of monitoring the CPU and optimizing its power usage. "Having this layer of software allows us to monitor the activity of the user and the application, and to vary the frequency and the voltage of the processor precisely so that we can extend battery life," said McKernan.

The company also is working on a public release of a compressed mobile Linux with enhanced power management that will fit into a 16MB footprint, and will include X Windows and a Netscape browser. ■

## EDITORIALS

## Atlas Shrugged

On Feb. 17, with much fanfare, Microsoft Corp. shipped Windows 2000, the successor to Windows NT 4. For the most part, the world yawned. A couple of visits to the local CompUSA showed a nearly empty store—a far contrast to the waiting-in-line-at-midnight rush to purchase Windows 95. A few individuals poke at the Windows 2000 display. That's all.

The media, too, was quiet. In San Francisco, where Bill Gates launched his company's latest flagship product, the local AM news station provided blow-by-blow of the introduction, but focused more on actor Patrick Stewart and the live performance by Santana. KCBS's reporter downplayed the event, repeatedly stating, "It's an operating system for business." In short, Win2K caused not much more stir than, oh, Y2K.

Maybe even less. On Thursday, Feb. 10, Microsoft's stock closed at 106. A week later, the day of the launch, it closed at 99 5/8, a drop of 6 percent, and about 16 percent off its high. During that same week, the NASDAQ climbed 1.4 percent. Perhaps Atlas didn't shrug, but Wall Street did.

To us, the most interesting feature of Windows 2000 is Active Directory; see our coverage on page 10. If used properly, AD could simplify the integration of applications onto an enterprise network, while providing a mechanism for centralized management. But by no surprise, since Active Directory is Windows 2000-specific, adopting that technology will tie you even more closely to Windows.

Similarly, the upcoming Microsoft Visual Studio 7 offers tantalizing technologies, including more enhancements to Visual Basic and a deepening commitment to XML. There's no doubt that with Visual Basic and its component model, Microsoft hit the ball out of the park, as the growth of third-party VBX/OCX marts like ComponentSource demonstrates. We can't help but think that if the Linux community truly wants to bring Big Bill down, they'll need to create a similar component model, as well as a thriving community of component builders and sellers.

## What About Linux?

Linux is coming on strong, and you don't need to see Wall Street send Linux-oriented initial public offerings sky-high to notice the trend. The recent \$2.44 billion purchase of Inprise Corp. by Corel Corp. is another sign that the market for Linux is growing. With this purchase, in fact, the industry will see the first development-tools powerhouse for the Linux platform. But even without Corel, some ISVs are seeing steady increases in their demand for Linux development tools. In fact, at platform-independent tools provider ParaSoft Corp., Linux has passed Windows NT as the No. 2 sales platform.

Corel is innovative in another way. At first, Linux was initially viewed as a low-end server platform, particularly when paired with the open-source Apache Web server, with its desktop appeal limited to power users and open-source developers. But now, with its latest release, Corel is targeting the desktop as well.

Besieged on all sides—Sun and Novell on the server front, Corel on the desktop, and the U.S. Department of Justice's antitrust case hanging overhead like the sword of Damocles—it will be interesting to see what Microsoft does next. ■

## GUEST VIEW

## KEEP YOUR EYE ON THE PROCESS

You have chosen a development environment, recruited a technically competent team and otherwise laid the groundwork for a successful software development project. One item may still stand between success and failure of your project. It is frequently overlooked, even though it does not need to break your budget, and it is entirely within your control as manager. It's process.

Process is too easily disregarded in the rush to code. Management, users, clients and VCs are all in a hurry to see a demo, and thus put a lot of pressure on the developers to ignore thorough requirements gathering, and functional and technical specification writing. These steps take time—and there is no dazzling demo at the end, nothing for the end user or client to try 'hands on,' nothing to show a VC except documentation. Documentation, especially technical specifications, will not usually inspire funding, nor are they eye-catching to the investment community in today's flashy e-world.

According to the Standish Group's *Chaos Report*, published in 1995, 31 percent of all software projects were cancelled before completion. Of the projects which were not cancelled, 53 percent cost 189 percent of their original estimates. Only 16 percent of all software development projects were completed on time and on budget, but this was not a true victory, since the software developed generally had less than half of the originally proposed features and functions. Although lack of process is not the only reason for such dismal statistics, we propose that it is one of the major reasons.

You may argue that new technologies such as Web-based development, UML, application servers, Java and the like may have improved these statistics. Technology certainly does have a positive impact on the success rate of software projects and time to market, but it's not a panacea.

The effects on the morale of the programming and development staff could be devastating if a process is not established and followed. In working with

companies that do not have an established process, our staff reports increased stress levels, as there is pressure to hurry up and do something, to 'finish' the project, but neither the 'something' nor the finished result is defined. The morale of the team further dips as they feel that their efforts are leading them only to project failure, and leading you to higher staff recruitment and retention costs.



VICTORIA  
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## ONE EXAMPLE

As developers, we at No Magic implement each phase of our client's project with our own software development process, comprising five major phases. Although these phases are not new, in our experience with clients we see that they are constantly overlooked and ignored. Phase One is writing the functional requirements specification, which describes what the system is going to do, or its functionality.

The second phase is a technical design specification, which details how, technically, the functionality will be implemented. During the specification phase, we find it is essential that the programmer who will implement that part of the code writes that part of the specification; this insures that the programmer really understands the problem and has analyzed and solved it. If a technical writer writes the specification, you will get a somewhat better style of specification but worse software.

In the third phase, upon iterations with our clients and receipt of client approval, we code modules and integrate the modules as quickly as possible, even though some modules may be shells. This code-integrate-code-integrate cycle, along with weekly code reviews, keeps us from falling into the syndrome of "the first 90 percent of the project taking 90 percent of the time, and the last 10 percent of the project taking the remaining 90 percent of the time."

Unit testing, functional verification testing, systems integration testing and production level testing follow as the fourth phase. During this phase, we ensure that the project meets

the metrics and standards set by Quality Assurance. If we follow these four steps religiously, the fifth phase, delivery to client site and on-site implementation, becomes simple.

## MORE DETAILS

Our functional requirements specification documents how the system looks and works when viewed from the user's perspective. Typically, more than 95 percent of the actual screens will be shown, with their function and use explained in detail.

The text of the functional specification becomes the foundation of context-sensitive online help in the final product. This document is also the basis of requirements testing, thus bringing Quality Assurance into the picture at this



PAUL  
DUNCANSON

first phase. The client liaison to our project team can review intermediate versions of this document and request changes. The client sees what their application will look like before one line of code is written, which ensures that the client gets a system that exactly meets their needs at the lowest possible cost.

In the second phase, we write the technical design specification using UML (Unified Modeling Language) diagrams to draw a "schematic" of the design of the proposed system. It explains in detail the system design—the structure of the system components, how they interact and how data is transferred and transformed as it flows through the system.

This detailed plan significantly reduces the time to code and test any software system and results in a much more robust and reliable system. This specification also functions as a maintenance manual, to document the design and significantly reduce both life-cycle cost and the cost of modifying the system in the future.

Finally, in the coding and testing phase, our coding standards and review procedures ensure the skillful and efficient implementation of the design. Coding is done, like both specifications, to a detailed project plan with both Gantt charts and

► continued on page 19

## INTEGRATING ENTERPRISE APPLICATIONS

It's a nasty problem—one of the nastiest, many would agree. Creating and implementing a strategy for enterprise application integration, or EAI, requires a big budget, a talented team, a big budget, hands-on support from systems vendors and consultants, expensive integration products and a lot of time and patience. Oh, did I mention a big budget?

One particularly vexing challenge facing any planned EAI project is that there isn't a *single* thing called EAI, because that newly popular buzzword implies that EAI is a tangible problem with a definable process and a clear set of goals that determine a solution set. It's none of these; there's no one-size-fits-all EAI solution—and don't let an EAI vendor or consultant tell you differently. Is your goal to breathe new life into stovepipe applications by adding messaging interfaces? Are you trying to integrate packaged applications? Is the end result supposed to be data mining? EAI can be all of those to your organization, or none of them.

Imagine my distaste with vendors who try to tell me that they've got the "best of breed" EAI solution. Imagine my delight when I found an excellent book from David S. Linthicum that describes *all* of the various aspects that might be considered part of an EAI problem, process and solution. If you're trying to get a handle on what EAI *might* mean for you and your organization, his aptly named "Enterprise Application Integration" covers all the bases. Although Linthicum is employed as CTO of Sega Software, his book—as with all his writing,

such as his column in *Enterprise Developer*—is remarkably free of perceptible bias.

### WHAT IS EAI ANYWAY?

The book begins with a discussion of EAI, plus the presentation of various ways of defining the concept. My favorite, and the one I use most frequently, is to combine multiple disparate applications into a single virtual application. But there's more to EAI than a clever concept: Because it's expensive, there must be a business reason to integrate those stovepipes, enterprise resource planning systems or even external apps. Linthicum doesn't spend a lot of time on that issue, and it would be nice if he spent more, perhaps with a case study or two, but he does a fair job of framing EAI in business terms.

Plan on spending a lot of time with chapters two through five—not because they're difficult to read, but because their meaning is essential to conceptualizing the essence of EAI. In those chapters, Linthicum describes in very definite terms four broad categories of EIA: data-level, application-interface-level, method-level and user-interface-level. Those four levels describe the basics of how information is pulled out of one existing application and fed into another one.

Do you want to go right to the data store by writing to the back-end database? Does each application offer published and documented APIs for which you can write external unidirectional or bidirectional access programs or scripts? Can you create methods, or business logic, using distributed objects or an application server? Or must you resort to simulating a

legacy app's user interface, perhaps scraping 3270 or 5250 screens or encapsulating them with objects?

Until you understand the distinctions (and perhaps have a handle on which of *your* applications can be accessed with which types of EAI), you can't develop a strategy for truly integrating them. Fortunately, the author's explanations make the distinctions crystal clear.

Once over the hump, move forward to chapter six, which introduces processes for tackling EAI problems. That feeds nicely into middleware—the technological glue that binds all the applications together.

Linthicum serves his audience well by holding his in-depth, six-chapter discussion of middleware until this point. Too many companies choose middleware based on flavor-of-the-month without regard for the fact that each of those technologies solves a different problem, and many solutions will require multiple types (or layers) of middleware, not a slavish devotion to the latest fad.

It would have been nice if the book went deeper into competing technology implementations, such as DCOM vs. CORBA, which does have some coverage, or Microsoft's MSMQ vs. IBM's MQSeries. In those cases Linthicum is breezy, with throwaway lines like "MQSeries is the 600-pound gorilla...it can do just about anything it pleases," contrasting with "MSMQ provides the best tool support 'out of the gate,' simply because it has been developed by Microsoft." Harumph.

The next section of "Enterprise Application Integration"

discusses general issues surrounding packaged applications—in this case, Linthicum focuses on SAP and PeopleSoft. It's an overview, nothing more: Fourteen pages on integrating R/3 using EIA and middleware can't be anything but.

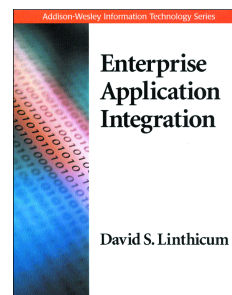
As the book winds toward a close, there's another breezy chapter on Extensible Markup Language and related standards; you won't gain much depth on XML from here (read "XML: A Manager's Guide," reviewed last issue, for a solid nonprogrammer's education), but the author does tie XML in with EAI, which is typically *not* one of the uses being touted by XML's major proponents, although it's a natural fit for messaging. And indeed, the

next chapter touts messaging brokering, which Linthicum calls "the preferred EAI engine."

Message brokers, in case you're not familiar with the concept, are servers that use a hub-and-spoke model to bridge multiple systems together, translating messages, distributed objects or business logic as appropriate. I like the definition "message brokers are middleware's middleware." Although Sega Software, Linthicum's employer, makes and sells a message-brokering product, he gives equal ink to other players in that market.

Bottom line: EAI is important, whether you're running mainframes, ERP or other systems. It can also be confusing. If you'd like to find a single book that makes it less confusing, this is the one to read. ■

"Enterprise Application Integration." David S. Linthicum. Addison Wesley Longman, 2000. Trade paper, 374 pages, \$39.95.



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resource allocation. The coding of the project is done in a series of three to five builds so that the components of each phase must exchange data and commands reliably for each build. All the functionality planned for implementation in that build is debugged and tested completely before going on to the coding of the next build. This prevents the end-product schedule slip-page typical in most software

projects done elsewhere when component interface incompatibilities are exposed during a single end-project integration.

We update and refine the project schedule after completion of the functional specification and again after the completion of the technical specification. During coding and testing, the client receives variance reports and actual project plan revisions at the completion of each build. This is the essence of the

"No Magic Process." Conscientiously followed, this process keeps the client in control of the project, keeps communication flowing between the developers and staff on the client side, and results in an "on-schedule within budget" completion of a software development project.

Do these steps seem simple? Of course they do—there's no magic here. For you to bring your development projects under control won't take magic ei-

ther—just hard work and attention to the basics. So stop looking for the mythical silver bullet and stick with the process, and you, too, can beat the odds. Even though your VC may initially yawn at the word "process," the marketplace will cheer the results. ■

Victoria Girdziunas is president and Paul Duncanson is CEO of No Magic Inc. (www.nomagic.com).

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# Linux Ain't Peanuts Anymore

BIG MERGERS MEAN NOT ONLY BIG DOLLARS, BUT BIG CORPORATE INTEREST

BY ALYSON BEHR

Vendors have seen such a significant increase in demand for Linux-based enterprise products that most of those who don't already have a product release to satisfy the clamor at least have a beta to talk about. For many of these vendors, Linux is not their lead platform; however, they see enough promise because of their customers' requests that they've increased both R&D and marketing resources, in some cases by over 50 percent, and some are brokering mergers based on Linux demand.

The recent Corel Corp. and Inprise Corp. merger agreement, valued at \$2.44 billion, will consolidate the software development prowess of Inprise/Borland with Corel's desktop Linux operating system. The combined company may create a dominant single source for the Linux operating system, applications and developer tools.

According to Michael Shindell, director of product management for Linux tools at Inprise/Borland, "Half of our marketing and R&D resources are going into Linux products. Currently, most of the effort is going into Kylix. Kylix will bring native rapid application tools, Delphi and C++ Builder, to the Linux platform."

## DEVELOPMENT-TOOL HOLE SPELLS OPPORTUNITY

Shindell acknowledged that there's a large hole in the area of application development for Linux, and said that Kylix is positioned to bring a development tool set to Linux that simplifies all of the complex technologies from desktop to Internet to distributed development. "Over the past five years, most companies' use of Linux has been primarily very task-oriented: e-mail server, Web server or router specific, and mainly for Internet appliance uses," he said. "Linux has worked very well in that capacity, but it's been very slow to be used as an application platform, either as an application server, a database server or a general-purpose server; or on the client side, as a client application. This has been primarily because of the lack of application availability."

Shindell said that Inprise (www.inprise.com) has already brought most of its other products—Interbase, Visibroker, CorbaOrb, Application Server and J Builder 3.0 Foundation—over to Linux.



Half of Inprise's marketing and R&D resources go into Linux, according to Michael Shindell.

Earlier this year, Inprise surprised the development community by lobbying a free download version of JBuilder 3 onto its site. Shindell said that downloads of its Linux version outnumbered the Windows version two to one.

Inprise/Borland conducted a survey that 24,000 developers participated in. Shindell said that over 70 percent of those developers said they were looking for RAD tools like Delphi and C Builder. Only 25 percent of those developers were interested in device driver development. Instead, their interest was in application, utility, client/server database and Internet Web server side development. "That's great news for us, because that's exactly what we do," said Shindell. "It really told us that Linux was turning the corner to an application-oriented platform."

While Shindell doesn't see Linux catching up with Microsoft's Windows or Sun's Solaris in market share anytime soon, he believes that, technologically, Linux is every bit as stable and delivers higher performance right now. He said that the primary barrier Linux faces in gaining market share in the enterprise is the investment that companies have made in Windows-based applications, infrastructure, training and support, and that it will take some compelling reasons for these companies to turn to Linux. True to his optimism, he believes that Linux will be able to offer these in the near future. "The future is really what we're excited about. We're very excited to see new uses for Linux in the direction of embedded computing, clustering and things that we haven't even heard or dreamed of yet."

## A RATIONAL APPROACH

Not all vendors have unlimited resources to throw at building market share. Tool vendor Rational Software Corp. (www.rational.com) is taking a much more cautious approach. According to Claudia Dent, vice president of Rational's Windows Suite Business Unit, the company currently supports application development for Linux with ClearCase 4.0, a configuration management app for distributed teams. Rational's customer demand is evenly spread between Windows and Unix. Dent said that 50 percent of its

customers are Windows based. The other half is a mix of Unix and Linux. "Our growth rate has clearly been in the Windows environment, but now we're seeing a renewed interest in Unix and Linux particularly for larger environments," said Dent. "Our customers want to see our entire suite of products running on Linux; the first demand was for ClearCase."

Dent sees demand for Linux across multiple segments, including Web application development, e-device management, telecommunications and infrastructure. "We've seen the most demand for Linux offerings in the Web development area. I can't predict whether Linux will catch up with Windows in the near term," she said.

While Rational recently announced that it will port product over to Intel's IA-64 processor line, Dent would only say that this will occur over the next year. She did not see barriers to Rational's support for Linux, stating, "We have a history of providing our development tools for platforms that our customers are actively requesting, and we view it as another platform that we need to aggressively support." That said, she would not commit to a time frame for further product support of Linux.

## FROM UNIX TO LINUX

Vendors that teethed on Unix are more comfortable allocating precious R&D funds toward

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# ONE LINUX, UNDER LINUS, INDIVISIBLE...

Even in the open-source movement, brands and marketing matter

BY DAVID RUBINSTEIN

As more programmers, software development teams and companies move toward widespread acceptance of the Linux operating system, a debate is raging within the community about its fragmentation.

Will fragmentation prove fatal to the Linux's evolution as an enterprise platform, as some fear, or is it a natural and inevitable result of the disparate factors that led to its development in the first place?

The answer, as with all questions, lies with whom you ask.

Beau Vrolyk is the senior vice president of computer systems at Silicon Graphics Inc. (www.sgi.com), which makes servers upon which Linux sits even as it continues supporting its own Unix variety, Irix. Vrolyk stated SGI's case rather bluntly: "If we allow [Linux] to fragment, we will miss the best opportunity we ever had."

Yet, the man who created Linux itself, Linus Torvalds, makes a strong argument that Linux will grow and spread into new areas of computing, without breaking up.

The open-source nature of Linux is such that software developers must share any modifications with others, preventing any one version from dominating. Torvalds emphasized in an address at the recent Linux World Expo in New York.

"[The license] forces everyone to live in harmony," Torvalds said, "even if they don't want to."

The fear, of course, comes from the need of Linux vendors to keep the financial markets happy. Those are the guys, you may recall, who were behind the huge run-ups in capitalization for such vendors as Red Hat Inc. and VA Linux Systems Inc., and the same fellows who would like to see larger market share and more return on their dollars. Each vendor may be forced to try to come up with versions that, like many developers themselves, may not work well with others.

Vrolyk believes Linux can be extended without damaging it. "Companies can differentiate themselves through packaging, overlays, support...without differentiating themselves through variations in the core operating system," he said.

According to a recent IDC survey, 24 percent of business operating systems now run Linux, up from 16 percent a year ago. Meanwhile, Windows, with NT and 2000, has remained stagnant at 38 percent over that time. The remainder is split between versions of Unix and Novell's NetWare. There has been speculation that the long delay in rolling out Windows 2000, originally targeted for mid-1999, has given Linux a chance to pick up steam.

## CUSTOMERS WANT

### TRUSTWORTHY BRANDS

SGI's Vrolyk said that branding is critical to the success of Linux vendors, and that it's the acceptance of a brand that enables a customer to comfortably buy the product. "People are desperately going to try to brand Linux," he said. "Fundamentally, all vendors are providing quality assurance and support of some sort. It all comes from the same source tree. To the customers, brand matters deeply. That's what allows IT managers to sell the use of Linux to their bosses." He added that if Red Hat, SuSe Inc. and VA Linux fail to establish strong, identifiable brands that customers can trust, they will not succeed.

In the future, he said, customers will demand a single-server operating system and will balk at paying so much for support. Citing the Unix example, which has been splintered into proprietary business systems, Vrolyk hopes Linux can remain widely functional no matter which version a company chooses to run.

Vrolyk said the industry must move in that direction, pointing up that IBM Corp., unlike Microsoft Corp. and Sun Microsystems Inc., is moving toward a layered business model, while the other two giants remain in what he termed a closed, monolithic, vertically integrated model—"a model

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## BIG LINUX BIZ

← continued from page 21

this burgeoning community. ParaSoft Corp. (www.parasoft.com) was born as a Unix shop but has recently seen the need to support Linux. Jim Clune, product manager for Insure++, a run-time error and debugging application, said, "We're there, and [Linux] is becoming an increasingly important platform for us. Recently, it's gained ground as our second-biggest seller." Solaris holds the No.1 spot, with Windows NT's sales slightly lower than Linux's. ParaSoft's Insure++ R&D resources are allocated to its new version 6.0, due for release this summer. Its primary new functionality will be a run-time error detection mode that doesn't require a rebuild. This mode will be available in both the Linux and Windows versions.

Clune believes that Linux acceptance in the enterprise depends primarily on whether the environment is migrating from a Windows or a Unix platform. "Enterprise transitions from Unix to Linux have been very smooth," he said. "We're

seeing more and more switches like this. For Windows-based companies there are barriers. These are mainly educational, or fear of the unknown."

Fragmentation of the operating system is problematic from Clune's standpoint. "In some ways, supporting Linux has



**Want Linux? It depends whether you're coming from Unix or Windows, believes ParaSoft's Jim Clune.**

been more difficult than the other Unix platforms because of the fact that practically everybody running Linux has their own customized kernel," he said. "Our official stance is that out of the box, we support the Red Hat distribution, but in reality, if something doesn't match up right, then we help them configure. So far, the splintering hasn't been a huge issue, but definitely more so with Linux than with other Unix platforms."

SilverStream Software Inc. (www.silverstream.com) is about

to release its Java 2 Enterprise Edition (J2EE)-based SilverStream Application Server 3.0. The application server currently supports Windows NT Server, Solaris and HP-UX 11.

According to Charlie Ungashick, director of product marketing at SilverStream, "Our goal is to always increase our ports and the number of platforms our customers can run on, but we didn't want to hold up the release of this server to our Windows NT, Solaris and Unix customers because of the current Linux landscape."

Ungashick added, "We are currently in the midst of our porting effort and going through the process of working with the latest release candidates of J2EE-compliant Linux JVMs, including Blackdown's Release 4.0 and the new Inprise/Sun Release 2.0 based on Blackdown code, to see which one we believe is the best."

Ungashick said that SilverStream anticipates having a version of its Application Server running on Linux "very soon" but declined to specify a release date because the porting

effort and final Java Virtual Machine hadn't been delivered. When pressed for a time frame, Ungashick said, "We are very aggressive about it, but I can't give any specifics because of the virtual machines. Obviously, we run on top of them and any minor shifts can be negative or positive. We've reported some technical issues to Sun as well as a few other vendors, and we're anticipating fixes. We're hoping that when they do release the final VMs they're as stable as the other release candidates."

SilverStream's current lead platform is Windows, primarily because its development environment is certified to run exclusively on Windows NT and its HP-UX 11 offering is only a year old. Windows NT is followed closely by Solaris. Its customer base is a mix of high-volume Web sites serving interactive and dynamic B-to-B applications as well as enterprises running strategic intranet and extranet applications.

Ungashick believes that it's an interesting time for the Linux market because of the shipment of Windows 2000 and Solaris 8.

"What you'll start to see is that corporate IT organizations are beginning to evaluate Linux as a player on the desktop against Windows 2000 and in the back office against Solaris 8. For the first time, with the latest versions of the Linux JVMs, Linux is becoming a head-to-head competitor and not just a hype or a fad."

### THE FINAL BATTLEFIELD

Legitimacy does not come without challenge. From Ungashick's point of view, the biggest possible hurdle for Linux, if there is one, will be application development for the desktop. "On the desktop, applications have always made or broken an operating system's livelihood. Later renditions of IBM's OS/2 are a good example of why a very good operating system didn't make it in a widespread corporate IT environment," he said. I don't know that desktop productivity suite applications are as critical to success as they once were. Applications are moving more to a Web-based model and application service providers are the wave of the future." ■



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# ONE LINUX

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which has failed," he said.

"[The layered model] gives tremendous economies of scale," Vrolyk said. "The leverage comes from millions of people using the same thing. The lowering of the price of Solaris to zero proves this."

## SUN DEFENDS ITS BUSINESS MODEL

Tom Goguen, Sun's group manager for Solaris, defended Sun's business model. "In terms of the price of things, people only want to pay what they have to pay for anything. That's a truism," he said. "To attack that model is quite interesting because that's the Linux model. We've adopted that model for Solaris. With Solaris 8, we've made binaries free with unlimited user licenses. We have made the source available for free. We have many different source licenses, but we are making it available."

Goguen said Solaris is free for systems that run from one to eight CPUs. The reason, he said, is to make the cost of getting involved with Solaris very low. "Around an operating system, there is basically a cyclical life that exists," Goguen said. "Developers develop to the platform, it thrives, that gives more reasons for people to buy it. You have to get this thing rolling, and it can become somewhat self-sustaining." More important, he said, the cost to get involved and to innovate on any one platform can be prohibitive if people are charging for that source. "You can benefit tremendously by encouraging new innovation by making source available for free," he said.

Goguen also said that while Sun could be considered vertically integrated, each of the different layers within Sun's stack has created a market for itself. "We've sold SPARC chips, we've sold Solaris which is IA-64 ready, [and] Java runs on all kinds of operating systems, including Linux," he said. "At each of the horizontal layers, we are fairly well represented across the board. It's unfair to say we're so tightly integrated that we can't run across other layers." However, the benefit to buying a stack of software and hardware that is integrated, he said, comes when you're trying to scale up the system and the

software engineers have some integration with the hardware engineers.

Goguen said Sun is doing a lot of work with the open-source community. "Linux and Solaris are close to each other in terms of their heritage," he said. "It's pretty easy to transfer from one to the other. If sud-

denly Linux became this wonderful operating system that scales like Solaris, there would be nothing stopping us from merging Solaris and Linux and branding it Solaris and keeping it going. Solaris is better when it comes to types of enterprise-class features our customers are asking for, but there are Linux

distributions available on SPARC systems, and they run quite nicely there."

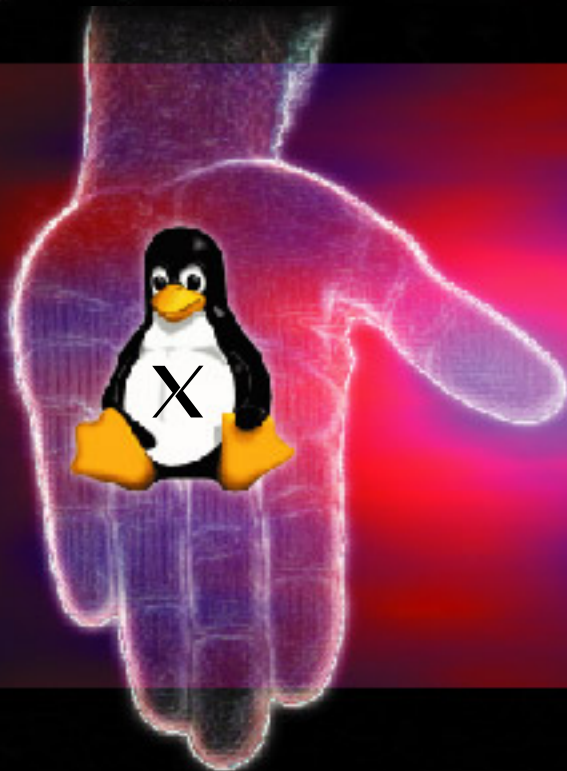
As for Windows 2000, Goguen said, "They [Microsoft] spent an extra two years getting it to market and it was designed for a world in which Windows desktops dominated the market and a world of tiny servers.

Well, the world has changed."

But according to Vrolyk, a key piece of Linux's success is that its development is in the hands of "a gang of guys, just hanging out, arguing, yelling. They have bake-off after bake-off, with no one in control. The guys with the suits can't fence that in or they'll destroy it." ■

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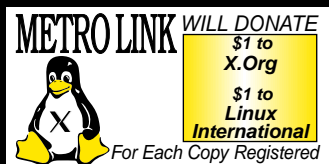
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## MICROSOFT'S DNA? WHOA!

Call me fussy, but I don't like the idea of having my e-commerce foundation called DNA. DNA is the double helix that makes me and not you. I like this double helix; sure it has its flaws, but anything that completely captures what makes me unique is not anything I want to think about Microsoft diddling with. So, when the Redmonites come knocking to talk to me about DNA, I get suspicious.

First of all they've got it all wrong. Distributed iNternet Architecture is what the "acronym" DNA refers to. The choice of letters continues the recent trend of using the second letter of a word rather than the first, if the second has more zing. I believe XML (eXtensible Markup Language) was the first popular technology to be named this way. Applying the technique to previous acronyms, you discover all sorts of possibilities that lay dormant for far too long. For all those years, MS-DOS was hideously misnamed. IS-DOS is much more compelling. Why didn't they think of that earlier? Conspiracy nuts will have a field day with this discovery.

But seriously, my suspicion of Microsoft's e-commerce strategy goes beyond

the choice of monikers. I am just not sure Microsoft is capable of delivering mission-critical software to the enterprise. To start with, Microsoft's Internet strategy has been muddled (rarely a sign of reliability). Certainly, it won the browser war(s). Regardless of the machinations that were highlighted at the antitrust trial, Microsoft's top spot in browsers is due in large part to technology, even if the path to victory was littered with acts of high-handed behavior. But the browser war was Microsoft's to win. Microsoft does desktops. But where does it go from there?

The various Web-server strategies strike me as confused. I see no coherent vision that is trying to set out to conquer the Internet or the Web. Indeed, Microsoft has a series of ho-hum offerings that compete unfavorably with open-source software. These offerings run on an operating system that hangs regularly and is, therefore, no one's choice for mission-critical computing.

Comes now e-commerce. Microsoft's strategy, termed DNA, is really all about XML. I was at the launch. And all anybody heard about was XML and Micro-

soft's attempts to standardize industry XML implementations using its own BizWire framework.

To its credit, Microsoft has implemented XML in Internet Explorer 5.0, but all other aspects of DNA are still awaiting shipment, already months late. BizWire has lots of partners waiting to do something, but no one is delivering anything. And as a result, Microsoft's e-commerce strategy looks a lot like something that will be relaunched under a different name within 12 months. You recall this was the strategy with OLE, COM, ActiveX, DCOM, COM+. Nothing is different here. When BizWire finally ships and other portions of DNA arrive, e-commerce will already have moved to different issues. And Microsoft will relaunch its e-commerce initiative.

Contrast this to IBM, where every aspect of the company tends toward e-commerce. IBM is a company that understands mission-critical computing, highly reliable operating systems and extended commitment to customers. To obtain its laurels as an e-commerce leader, IBM has had to align the entire company to fit the new mission. Microsoft is a long way from doing this. Microsoft is testing its e-commerce strategy. It's putting its big toe in the water to see if it's safe. IBM, by comparison, is in the deep end.

So what does this have to do with middleware? Everything. It should seem pretty clear today that the distributed computing model will insinuate itself into most aspects of the enterprise. And the driver for this process is the Internet—specifically the e-commerce aspect.

As e-commerce becomes a larger slice of total sales for many companies, even the laggards will be forced to accept this new way of designing computing infrastructure. And at the center of this model is middleware: the essential communication between disparate pieces of the distributed solution.

In last issue's column, I discussed how enterprise Java and CORBA are the keys to modern distributed computing. But for sites using more traditional computing paradigms, standard piping such as messaging-oriented middleware will be an important player. And in this arena, the enterprise-oriented company, the one that has provided mission-critical apps with reliable solutions, is the one that will get the nod. Think IBM. Microsoft, DNA or not, cannot yet prove that it's ready to play in this space. ■

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## A SURPRISING OPEN-SOURCE CHAMPION

I hate the software biz sometimes. Especially now with the accursed UCITA, vendor-sponsored FUD pages and the Linux-IPO craze. You can't log on to the Internet without tripping over a bushel of cookie-setting animated banner ads. Trade shows are full of product pitches and slick demos masquerading as technical sessions. The whole dang industry is crawling with hucksters and slimy slithering marketers. It's hard to know who to trust.

It's a good thing for you I'm here. Who do you trust? Trust me! I'm the only one who's on your side. The writing may be mundane and the insights unextraordinary, but I promise you unvarnished truth by the bale. You can count on it.

### THE POINT, IF I HAVE ONE

In the previous issue—you can probably find it online somewhere but don't ask me where; the editors don't talk to me except to nag about deadlines—I exposed Sun Microsystems as an open-source pretender, taking the company to task for abandoning the international Java-standardization process, failing to acknowledge an open-source work group in the creation of its Linux-based Java tools, releasing Solaris 8 on a phony open basis, and riding in enclosed elevators without sufficient breath mints. I promised to highlight a praiseworthy company in this issue.

That company, surprisingly enough, is IBM.

That's right, the company that personified the notion of closed-source proprietary software. The company whose arrogance led the entire industry to think Microsoft—Microsoft!—would be a preferable standard bearer.

What you may not know is the extent to which IBM has exercised beneficence and insight in response to the open-source movement. Over the past year IBM has compiled an exemplary track record.

For example...the company has released significant proprietary technology to the open-source community under comprehensible, industry-standard licenses. Technology like the Journaled File System for Linux, Jikes, cross-platform classes for Unicode support, useful sets of Java Beans and more.

For example...the company has announced that its future server offerings will be Linux-compatible, and has appointed a Linux czar, Irving Wladawsky-Berger, head of the newly formed Enterprise Systems group, to make it so. Wladawsky-Berger's job is to make Linux an equal partner with S/390, AS/400 and AIX.

For example...IBM's Developerworks and Alphaworks initiatives represent a genuine effort to establish a dialog

between IBM's technical staff and the developer community. News and tutorial material, feedback mechanisms, technology previews and free downloads all lead to the conclusion that IBM has real respect for developers and their needs. (Visit the sites at [www.ibm.com/developer](http://www.ibm.com/developer) and [www.alphaworks.ibm.com](http://www.alphaworks.ibm.com).)

For example...IBM is on the right side of the standards battles in Java and XML.

IBM has dropped tantalizing hints that it intends to lead an industrywide consolidation of Linux with AIX, SCO Unix and other Unix variants. One of its strategies is to yield up proprietary technology—including big chunks of AIX—to the open-source community. The company believes that through this strategy, it can aid in Linux's evolution into an enterprise operating system. In the long term, AIX could be nothing more than a feature-packed high-end version of the industry-standard operating system for database, network and enterprise servers: IBM Linux. It reads deliciously like revenge against Microsoft's betrayal of OS/2.

IBM states that it remains committed to Windows NT, of course, and even Windows 2000. But the enthusiasm at Big Blue seems reserved for Linux and open-source technology.

### WHERE DO YOU REALLY WANT TO GO TODAY?

Did you ever notice that when people ask "Where do you want to go today?"

they already have your destination in mind? According to closed-source, proprietary publishing tradition, the author of a column has complete control of the topics and the treatment. To break with that tradition, in the spirit of the open-source ethos, I'm not going to dictate what future columns will be about. I'll let you tell me. Here are some topics we could explore together:

- Why the guys in black hats love the UCITA—and why it's bad law
- Kick 'em while they're down—more Sun-bashing
- Hey, what ever happened to BSD?
- Why don't those open-source guys get a haircut?
- Has Slashdot sold out?
- Where to find open-source development tools
- Why the Linux Standards Base is essential to your future
- Rating the open-source repositories
- Linux in the post-PC era
- The beginning of the end for Microsoft

Drop me a line at [jdh@sdtimes.com](mailto:jdh@sdtimes.com). Let me know which of these topics strikes your fancy, or propose new topics. I promise to be bound by your decision about which topics to cover. ■

*J.D. Hildebrand is the former editor of such publications as Computer Language, Unix Review and Windows Tech Journal. Reach him at [jdh@sdtimes.com](mailto:jdh@sdtimes.com).*

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## WINDOWS AND OPEN SOURCE? MOSTLY A YAWN

As I write this in late February, today was an open-source kind of day. First, Bloomberg ran a story claiming that Bill Gates offered to open the source code to Windows if the government would allow that action to settle its antitrust case against Microsoft Corp. Naturally, this started a blizzard of e-mails and discussion threads, all trying to cope with the possible ramifications of such a move. And all this was only to culminate in an anti-climactic denial by Microsoft's PR minions that Gates ever said anything of the sort and an immediate return to the party line: "We are doing our best to settle this case."

You can almost see the large hooked cane yanking Billy G. off the stage, can't you? No disrespect to Microsoft, but who are they kidding with this he-never-said-any-such-thing line? This is Bloomberg we're talking about, not the *National Enquirer*.

The concept of an open-source Windows operating system isn't nearly all it's cracked up to be on the surface anyway.

First, Microsoft is being sued only over Windows 95/98, which doesn't necessarily mean any court decision would affect Windows NT/2000.

Second, that's a lot of source code

we're talking about. Microsoft's programmers never heard of Jenny Craig when it comes to code bloat, so it would take even the most talented open-source aficionados quite some time to make heads or tails of raw Redmondian runes. Not to mention that if only the Windows source code is opened and not related technologies such as COM, the gesture becomes even weaker.

SD TIMES

WINWATCH

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### UP A LEVEL

But what about open source *on top of Windows*? Shortly before Mr. Gates allegedly did the open-mouth-insert-foot dance, the folks over at the newly merged Redhat/Cygnus pointed me at a not-so-new tool called Cygwin. The upshot is that the Cygwin product will deliver a stable Unix/Linux shell and development environment on top of Windows NT, thereby allowing developers to quickly port Unix or Linux applications to Windows. In addition, the cygwin.dll will be used solely to develop open-source applications—yeah, that caught me, too; but more on that later.

Redhat/Cygnus maintains that Cygwin is solving one of the biggest migraines that developers can face: managing applications across heterogeneous

operating-system platforms. By developing cygwin.dll, the company claims Redhat/Cygnus allows Unix-oriented developers to better adapt to a Windows-centric environment.

Frankly, I don't get an adrenaline surge here, either. While there are a significant number of developers out there who would rather work under a Unix-like environment than any form of Windows, how big is this market really? How big an influence will it have? Those developers will still be developing Windows applications, so to me at least it makes more sense to do it under the native operating system, which is what Cygwin does in a way, but then again, not, if you see what I mean.

And the concept of porting open-source applications to Windows NT is equally niche. Sure, there may be open-source and Unix applications that outperform their native Win32 equivalents, but the number of apps that would really benefit from being ported must be minuscule. Especially when you consider how much easier it is simply to run a dedicated Unix or Linux box next to an Windows NT/2000 server farm, now that we can make use of a smart network directory structure.

An interesting aspect of the Cygwin deal was its licensing structure. A single-user copy of Cygwin 1.0 costs \$99, while the same license for Cygnus' native

Win32-compatible GNUPro ran around \$79. In larger development environments, subscriptions for these packages would quickly run into the thousands of dollars when you include things like developer support and a commercial-use license to the Cygwin libraries. This brings up a multithorned issue: Red Hat/Cygnus built a large chunk of Cygwin with open-source software and markets it for use in developing open-source software, yet charges commercial prices for its use. How cool is that?

Admittedly, I'm deliberately ignoring the philosophical picture here: The ability to easily port Linux applications to Windows NT and vice versa means more free software functionality which should, in theory, be good for everyone. But as my editors have often pointed out—typically with blunt objects and head trauma—my function here isn't to philosophize, but to keep track of things that might help businesses that are developing for the Windows environment. While Cygwin may make some Unix-centric programmers more at home under Windows NT, I don't see professional shops raising their collective eyebrows. We've got other headaches. ■

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- **Formula One is built in the Java programming language and is ideal for widespread distribution on the Web.** Excel and Office Web Components are designed for use behind a firewall and require Microsoft Office to be installed on all desktops.
- **Formula One's architecture and JDBC methods enable it to be used with a wide variety of database and application servers.** Excel can't.
- **Formula One provides a JavaBean and applet with an API of more than 400 properties, methods, and events.** Excel is not an API-driven application and can not be used as a component in a Java application.



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## WHAT GOES AROUND, COMES AROUND

Remember the small start-up that only last year was banging on venture-capital doors trying to get the cash it needed to buy a few Super Bowl ads? Today that same start-up, flush with funds from its IPO, is now on the other end of the stick, providing working capital for the next crop of small start-ups.

Corporations are forming venture-capital programs at a greater rate than ever before. According to *The Corporate Venturing Report*, an industry newsletter, a total of \$6.3 billion was allotted for venture programs in 1999, up from \$1.7 billion the year before. And there does not appear to be any slowdown in the flow of dollars being tossed into the high-tech wind.

"VC firms are still driving the investments in small start-ups," said David Barry, senior editor of *The Corporate Venturing Report*. "But now you have companies that as recently as last year were raising money turning around and making investments." As an example, Barry cited a company called Critical Path, which received a \$33 million round of funding in January 1999 and invested in two companies in October.

Barry said that in past years, you'd see

a corporation involved in this type of capital deal perhaps once per month. Now, he said, "It's become every other deal."

And, for the most part, the investments have been amazing success stories. The report cites Apple Computer Corp., which turned a \$15 million investment in Internet company Akamai Technologies Inc. into a stake worth \$1 billion. Intel Corp. was the most active venture firm last year, making 38 investments, with Microsoft (20) and Cisco (13) also doling out huge amounts.

This certainly benefits the start-up, which receives venture funding to get going and then seeks out a corporate partner to help it develop the product and get it to market. And it benefits the capitalist by getting a stake in the young company.

Part of what's driving corporations into this type of investment is their own stock prices. When a company gets large, it becomes more difficult to maintain the rates of growth established in the formative years. Therefore, they need to invest in smaller companies to stay competitive and to move into areas of different technologies. Intel, for example, is not investing only in chip man-

ufacturers, but also in companies that build software to run on its processors.

The successful initial public offering of Neoforma.com Inc. is paying big dividends for Dell Computer Corp., which invested \$25 million last fall for 4.4 million shares. Neoforma, an online exchange for medical products, went public on Jan. 24 at \$13 and quickly went as high as \$60. At the end of January, Neoforma shares were trading at around \$45, giving Dell a stake worth nearly \$200 million.

However, the market analysts will be wary of the effect of these transactions. The investing companies could sell off huge blocks of shares for equally huge infusions of cash. Stock analysts might look at these sales as a one-time event, instead of the investment as a growth opportunity, and the capital company won't get a boost to its own share price.

But there's all that cash. What a nice problem to have.

### STREET SWEEPING

Application service provider Interliant Inc. announced its intention to raise \$125 million (excluding any over-allotments) through a Rule 144A offering of convertible subordinated notes. The notes will be convertible into shares of Interliant's common stock at a conversion price to be determined. It also

announced it has raised \$17.5 million in strategic funding via investments from Dell Computer Corp. and BMC Software Inc. ... The XMLFund has made what it calls a sizable investment in a 3-month-old start-up called ThinkView, which develops media syndication solutions. ... Codexa, an ASP for Wall Street professionals, has completed an \$8 million initial financing round.

Allegrix Inc., a privately held company providing ASP-enabling services to ISVs and VARs, said it has raised \$5.6 million in the company's first round of financing. ... M&A West Inc. announced it has established the subsidiary Linux Ventures Inc. as a holding company for investment and development opportunities. Current investments include Open-Express.com Inc., Links2Linux.com and LinuxFunding.com.

The board of directors of Sybase Inc. has approved the repurchase of up to an additional \$50 million of the company's outstanding common stock, extending an original \$100 million buy-back plan. ... Sequoia Software Corp. has filed with the Securities and Exchange Commission to sell up to a maximum of \$60 million of its common stock. There was no offering price range announced. ■

*David Rubinstein is executive editor of SD Times.*

## PLANNING FOR WINDOWS 2000

Okay, so Windows 2000 is here. Now what should you do about it, particularly in terms of building and deploying end-user applications on Windows 2000 Professional? There are definitely benefits to migrating Windows 9x or even Windows NT desktops to Windows 2000 to take advantage of new networking and Internet capabilities. You'll be working with your network and end-user support managers in this area, but even so, my recommendation is to go slowly.

For enterprise applications, there are compelling features of Windows 2000 that bear further examination, such as the ability to support encrypted sessions across the Internet, new tools to set up clustered computers, and a new way to administer all Windows 2000 services using the Management Console.

Chances are, you already have a few test machines running one or more of its three versions (Professional, Server and Advanced Server). If not, you should go out and get a copy of Windows 2000 Server now, as it contains almost everything you'd want to examine, such as Active Directory, IIS version 5 and security enhancements.

But before you get caught up in the hype around the features and start your developers working on Windows 2000-specific desktop applications, let's look at a few critical areas for migrating your users and upgrading your existing network.

First—and this may sound basic—do a RAM and CPU census on your desktop population. You'll have problems deploying Windows 2000 Professional on existing hardware if you have purchased a majority of your machines prior to 1998, or if your users have less than 128MB installed or PCs with slower than 166MHz Pentium processors. Plan on installing more memory, or else buy new equipment.

Second, if your applications are dependent on Microsoft's Exchange Server, wait before upgrading those systems to Windows 2000. Microsoft is still working out the bugs on integrating Exchange into Active Directory, and if you are satisfied with the stability of your existing Exchange system, then don't introduce Windows 2000 into the mix quite yet.

With other BackOffice components, such as SQL Server and Transaction Server, install a test machine with Windows 2000 Advanced Server as soon as you can. These components should benefit from performance improvements in the new operating system.

Third, don't migrate your primary domain controllers just yet. Install Windows 2000 and operate it in "mixed mode"—where it will support both old-style NT domain controllers and the

newer Active Directory hierarchy. This will give your team a chance to test application compatibility and determine if Active Directory provides any benefits for your setup. As long as your network continues to have any NT domain controllers, you'll need to continue operating in this mixed mode.

Fourth, make sure that Windows 2000 can find all of your existing network peripherals attached to older Windows NT and Windows 95/98 machines, such as printers, fax servers, tape servers and the like. There have been early reports of problems in this area, and you may have to move these shared devices to Windows 2000 servers. That may be an issue, depending on where these devices are attached and how many of them you have.

### A FEW OF MY FAVORITE THINGS

With these caveats in mind, which new features make the most sense to examine first? My three favorites are WebDAV, mobility support and virtual private networking (VPN) support.

WebDAV (for Distributed Authoring and Development) makes it easier for intranet publishing and for your development team—or even corporate end users—to collaborate on documents across the Internet. This feature is built into IIS version 5 and supported by Internet Explorer 5.0 and Microsoft Office 2000.

Windows 2000 includes many new features that make it easier for mobile users to go about their computing lives. Two notable ones are the ability to hot dock and undock from a network without having to reboot or reconfigure your networking components, and the ability to synchronize your files with a server and still have these files available when you are disconnected.

Finally, Windows 2000 offers built-in support for VPNs and for maintaining secure connections over the public Internet. These and other security improvements will take some effort to configure properly, and the documentation could be better, but it is an important start for Microsoft, and eventually other vendors will offer enhancements to the basic protocols that come with the operating system.

These features are big improvements over what existed in earlier versions of Windows. But remember that Windows 2000 is the first version of a new operating system, and there will be deployment problems and support issues. Stay in lock step with your network and end-user support managers. Any rollout of business-critical applications that require the new operating system shouldn't be faster than they're comfortable with. ■

*David Strom is president of David Strom Inc. and editor of the Web Informant newsletter. Reach him at david@strom.com.*

## News Briefs

### MORE PRODUCTS

◀ continued from page 5 in the second quarter. Developer licenses start at \$2,000 for **PowerTier Advanced Server** and \$7,500 for **PowerTier Enterprise Server**. . . . Microsoft Corp. has released to manufacturing **Interix 2.2**, an environment for running Unix applications and scripts on Windows NT/2000 without rewriting code. . . . The InfoWorld Test Center has named Red Hat Inc.'s **Red Hat Linux 6.1** its operating system Product of the Year in 1999. . . . Tibco Software Inc. will release its **Pragmatic General Multicast (PGM)** application as open source. . . . Sun Microsystems Inc. has submitted **Java 2 Enterprise Edition (J2EE)** and the **Java 2 Standard Edition (J2SE)** to the Java Community Process program. Sun submitted two Java Specification Requests (JSRs) to the JCP: one for J2SE 1.4, the successor to J2SE 1.3, which is currently available as a beta release; and another for J2EE 1.3, the next release of J2EE, which has been shipping in version 1.2 since December 1999. The JSR is the first step in developing or revising a Java technology specification. Sun also has entered into an agreement with Caldera Systems Inc., in which Caldera will ship Sun's J2SE and Java HotSpot Virtual Machine later this year. . . . PointBase Inc. has shipped **PointBase 3**, which adds new features to the company's object-relational Java database. Version 3 offers SQL-standard database triggers, enhanced developer tools, improved performance and multibyte character support for international languages, through compliance with the Unicode standard. . . . Serena Software Inc. has updated its database management tool kit, **StarTool 6.1.0**, which now supports DB2. . . . Rational Software Corp. has announced the availability of **QuickStart**, new services to help customers adopt Rational's products. QuickStart programs are available for Rational's Rose, ClearCase and ClearQuest products. . . . Concurrent Computer Corp. will offer a Linux version of its **NightStar** development tools and its C/C++, FORTRAN and Ada compilers. Developers will now have the option to either run their real-time multiprocess applications using Concurrent's real-time operating system, PowerMAX OS, or run their open-systems real-time applications using the Linux operating system. In addition, Concurrent's next-generation **Power Hawk** integrated real-time computer system will be available with either PowerMAX OS or Linux operating systems. The new Power Hawk system will allow the developer to select any number of CPUs (up to 32), either the PowerMAX operating system or Linux or both in a single VME chassis.

### PEOPLE

**James Richardson** will be senior vice president of Cisco Systems Inc.'s enterprise line of business as of June 1. He will also assume responsibility for the Application Technology Group, comprising the former operations of recent acquisitions Amteva, Geotel and Weblin. . . . **Tim Breidigan**, 36, who rose through the ranks of Microsoft Corp. to become publisher of Microsoft Network and director of field marketing, has joined the board of directors of Uniloc Co. . . . ProcureNet Inc. has named **Reuven Battat**, a former top Computer Associates International Inc. executive, as president and CEO. At the same time, Battat acquired a significant minority stake in ProcureNet. Most recently, Battat, 43, was president of interBiz Solutions, CA's eBusiness division. . . . ASP Industry Consortium chairman **Traver Gruen-Kennedy** has joined CyLex Systems Inc.'s board of directors. . . . Inprise President and CEO **Dale Fuller** has joined the board of advisers at AboveTrade.com, an online investment firm. . . . **Hugo Sanchez** has joined Integrated Chipware as director of product marketing for RTM Workshop, the company's requirements management product line. Sanchez spent the past four years at Rational Software Corp., where he held a number of director positions in the areas of licensing, product management and marketing. . . . **Kyle Brown** is the new vice president of ASP services at eAssist.com, which offers Internet-based customer support and demand creation services. ■

## VISUAL STUDIO

◀ continued from page 1

ers to create HTML-based forms that will be rendered on the server, permitting them to be displayed on any browser and any platform.

According to the company, developers will be able to drag and drop built-in Web-centric controls onto a form and double-click those controls to edit their properties or add special instructions. Some of that functionality, in the form of optional components, is already present in Visual Basic 6.0 Enterprise Edition.

The new features will be fully implemented with Visual Basic 7.0 and Visual Studio 7.0, which Microsoft said are scheduled for release toward the end of this year. The company will take an interim step by releasing Web Services Tool Kits for Visual Basic 6.0 and Visual Studio 6.0 this month.

Windows 2000 also presents some features important to Microsoft's vision of the Internet user experience, including core services for the Web, an integrated XML parser and an application server built around Windows Distributed Internet Application (DNA) architecture, which itself is at the very core of the company's Web strategy.

### IT'S IN THE GENES

Ballmer described Windows DNA as a set of technologies permitting developers to build a three-tiered application, which includes the client, the application logic and the data, and communicates using a variety of protocols, including TCP/IP, HTTP, plus Simple Object Access Protocol (SOAP) for communicating between layers.

Other core capabilities built into Windows 2000 include COM+, new ASP services, Active Directory, transaction and queuing services, plus connection and database-access architecture.

These capabilities will be available either at the presentation or client layers, he said, to provide users with either a thin-client browser experience or a rich client with code running locally, on the server or Web site or both.

"Because the backbone of the way in which programs will work with other programs on the Web is this kind of XML message passing," Ballmer said,

"XML will usher in [the] next generation of the programmable Web."

### JUST ADDING A BUZZWORD?

But shoe-horning a popular product to make it fit a new development paradigm may not be the ideal strategy. That was the feeling of Nancy Lee, XML product marketing manager at Sun Microsystems Inc. "They're taking some legacy tool and trying to force it into the Web environment, and that doesn't really make sense," she said. "Ideally, you want to start from a technology that is built for the Web," she continued, referring to Sun's Java programming language, the origin of which she compared to that of XML, as both grew from a Web-related need.

During his speech, Ballmer reiterated Microsoft's firm commitment to providing Visual Basic developers with in-depth support for XML, the specialized markup language for Web data exchange and interoperability. But providing tools for making data cross-platform only solves part of the problem, according to Sun's Lee.

"If you're building to the Web environment, you want to have your applications running on any platform," she said, "because depending on the application, [many times] it is just as important to provide business logic that is cross-platform, too."

Sun, long a supporter of XML, is scheduled to release later this month its Java API for XML Parsing, which will permit Java developers to plug any XML-compliant parser into their applications.

"It provides the glue to make your Java applications XML-capable," said Lee, who spoke about the future and about Sun's commitment to the XML standard with upcoming products like Adelard, the code name for its XML data binding project scheduled for release later this year.

"What you will see is a number of vendors who will be supporting XML, because it makes a lot of sense," Lee said. "[What's important to developers is] whether they are supporting it to add value to their application, or just to capitalize on the buzz around XML." ■

## AS/400 PASE

◀ continued from page 1

OS/400 operating services exposed to users and applications, including the user interface and APIs for Integrated Language Environment (ILE), the native OS/400 application services.

With PASE under OS/400 4.4, the operating system now includes a second set of application services: AIX libraries and APIs. The AIX APIs actually map to ILE's APIs. According to IBM, this allows resource sharing between AIX and OS/400 applications, such as printers, network connections or even databases.

AIX applications running under PASE will therefore look like ILE applications to AS/400 operators. AIX applications will need to be recompiled to run under AS/400 PASE.

### NEW AS/400 APPLICATION SERVICE PROVIDER HOSTS

IBM also announced seven new AS/400 application-hosting companies, which will either serve as application service providers themselves or offer hosting services to independent software vendors entering

the ASP business.

The new hosting providers are Affiliated Computer Services Inc. (www.acs-inc.com), Data Processing Services Inc. (www.dpslink.com), DCS Group plc's Digica division (www.digica.com), Eviciti Corp. (www.eviciti.com), JJ Croney & Associates Inc. (www.j2ca.com), Prominic .Net Inc. (www.prominic.net) and SunGard Data Systems Inc. (www.sungard.com).

According to IBM spokesman Tim Schuetz, these companies will provide a variety of services, including networking, end-user support and disaster recovery and back-up, based on the AS/400 platform.

"These hosting firms are providing critically needed resources to IBM AS/400 ISVs, who have good applications but not the infrastructure to deliver their products to the end user through the ASP model," said Schuetz.

"By working with these hosting facilities, ISVs gain access to a stable, managed environment, which enables them to provide their own applications and services to customers without the need to expend large capital sums on infrastructure," he said. ■



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